Shop Tips Blow-Out!

3 FREE Plans for Great Shop Projects!
See p. 42

AMERICAN WOODWORKER

BUILD YOUR SKILLS • BUILD YOUR SHOP

104 Great tips, jigs techniques & tools



Tricks for tighter joints



Tips for flawless finishes



Easy tablesaw jigs

PLUS

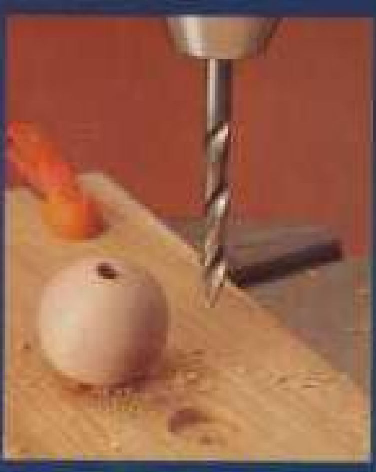
Pimp your power tools! 11 cool accessories

Our annual Oops! Special

#126 December 2006/ January 2007
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A goof-proof crown molding jig



Problem-solving drill press tips

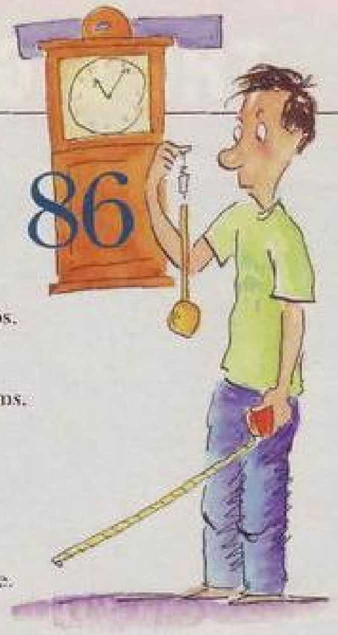


Our favorite stocking-stuffer tools

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#126, JANUARY 2007

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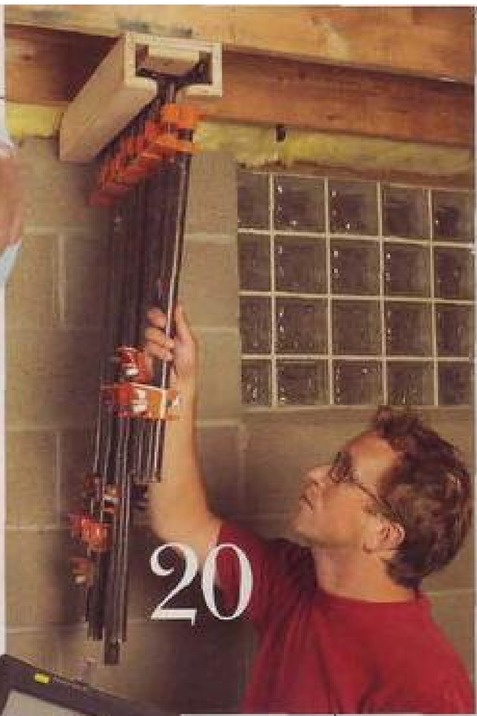


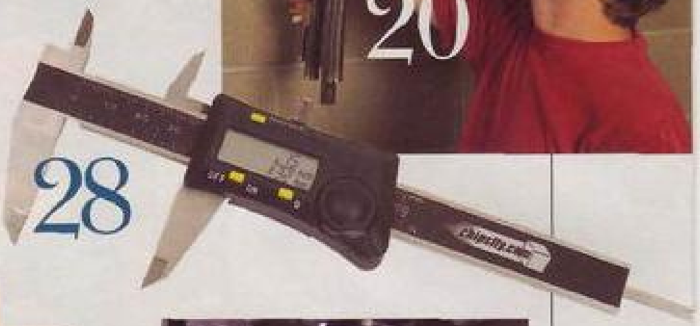




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COVER PHOTOGRAPHY (LEFT TO RIGHT): TOP: MIKE KRIVIT, BILL ZUEHLKE, RAMON MORENO
BOTTOM: STAFF, STAFF, MIKE KRIVIT



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PUBLISHED BY HOME SERVICE PUBLICATIONS, INC., A SUBSIDIARY OF THE READER'S DIGEST ASSOCIATION, INC.

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Issue #126. American Woodworker®, ISSN 1074-9152, USPS 738-710 Published bimonthly, except monthly October and November by Home Service Publications, Inc., 260 Madison Avenue, 5th Floor, New York, NY 10016. Periodicals postage paid at New York, NY and additional mailing offices. Postmaster: Send change of address notice to American Woodworker®, P.O. Box 8148, Red Oak, IA 51591-1148. Subscription rates: U.S. one-year, $24.98. Single copy, $5.99. Canada one-year, $29.98 (U.S. Funds); GST # R122988611. Foreign surface one-year, $29.98 (U.S. Funds). U.S. newsstand distribution by Hearst Distribution Group, New York, NY 10019. In Canada: Postage paid at Gateway, Mississauga, Ontario; CPM# 1447866. Send returns and address changes to American Woodworker®, P.O. Box 8148, Red Oak, IA, USA 51591-1148. Printed in USA.

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EDITOR'S LETTER

I Love Tips and Jigs

Whether you are new to woodworking or a professional, successfully mastering the craft requires broad knowledge and many skills. First you must understand the material itself. No two woods are the same. Oak and pine, for example, have very different working characteristics. Then you must become competent with machines and tools to turn rough boards into finished parts. You also need to know what kind of joints to use and how to make them accurately. Of course, you also face decisions about design, finishing and hardware. It's a lot to learn and requires hours of shop time. Let's face it, woodworking has a pretty long learning curve, yet it's incredibly satisfying to step back to admire the work of one's hands when a project is finally done.

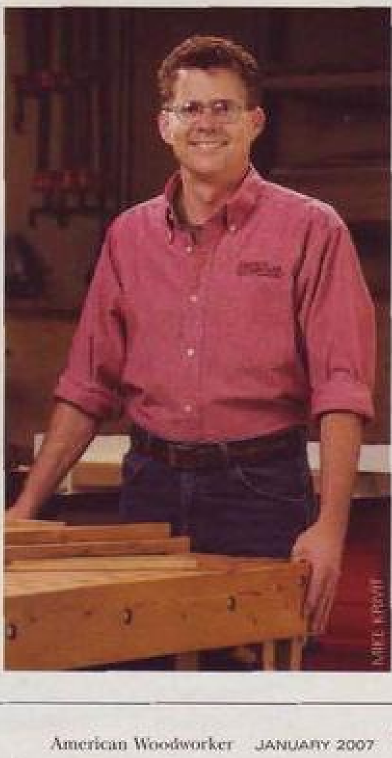
Three key ingredients of the machining and building processes have always fascinated me—jigs, tips and tools. Based on the mail you send us here at *American Woodworker,* most woodworkers share these interests. That's why nearly this entire issue is dedicated to those three topics.

You can peruse some of our favorite tool upgrades in Tool Talk (page 38) and find "14 Great Little Tools" (page 54) that add to the pleasure and precision of working in your shop. Are you interested in extending your tools' usefulness? Check out four super tablesaw jigs (page 68), a jig for your miter saw (page 66) and new jobs for your drill press (page 62). You'll also find tips for making tighter joints (page 48), improving your finishing work (page 58) and turning pommels on table legs (page 34).

Of course, you're not really a serious woodworker until you've made a few woodworking mistakes. If you want to learn from others' mishaps (and enjoy a laugh), check out the Oops! Special on page 86.

If these tips, tricks and jigs inspire you to share one of your own, you can send it to Workshop Tips, *American Woodworker* magazine, 2915 Commers Drive, Eagan, MN, 55121, or workshoptips@readersdigest.com.

Randy Johnson
Editor
American Woodworker magazine
randy_johnson@rd.com



MIKE KRIVIT

by Bill Szydlo *and* Ed Krause



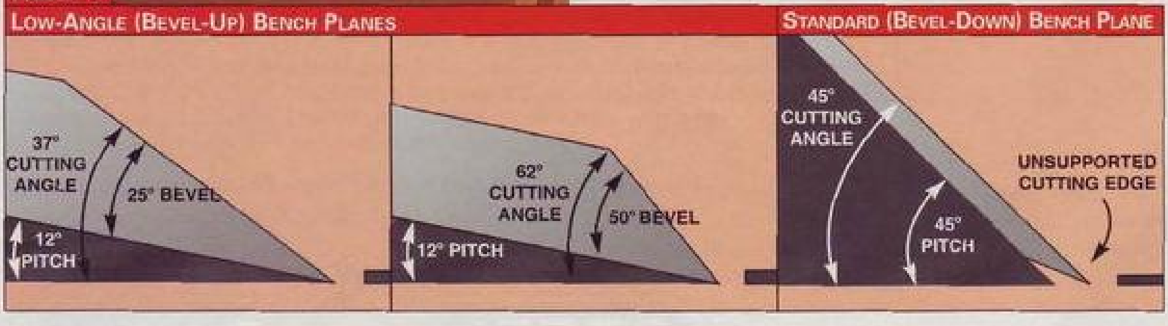
Low-Angle Planes Provide Versatility

Q What advantage does a low-angle bench plane have over a standard bench plane?

A Low-angle bench planes allow you to change the blade's effective cutting angle to suit specific tasks. Because the bevel points up on a low-angle plane, the effective cutting angle can be varied based on the iron's bevel angle. The bevel-up configuration also means the plane blade is fully supported right up to the cutting edge. With the bevel down, the cutting edge remains unsupported along the bevel, which can lead to blade chatter (Fig. A, below).

To get the most out of your low-angle bench plane, it's best to have two or three blades on hand with various bevel angles already ground on them (Fig. A). A 25-degree bevel ground on the cutting iron will produce a low cutting angle of 37 degrees that's ideal for shaving end grain (see photo, left). A 35-degree bevel approximates the 45-degree cutting angle on a standard bench plane, which is best-suited for general planing tasks. A 50-degree bevel creates a high cutting angle of 62 degrees for more of a scraping cut that reduces tearout on squirrelly grained wood, such as bird's-eye maple.

FIGURE A



The cutting angle is simply the sum of the bevel angle and the plane-bed angle or pitch. The pitch of a low-angle bench plane is 12 degrees, but its effective cutting angle can be varied based on the iron's bevel angle. Standard bench planes usually have a pitch of 45 degrees, often referred to as common, or York, pitch. Since the plane is bevel down, the effective cutting angle remains at 45 degrees no matter what angle is ground on the bevel.

EDITOR: DAVE MUNKITTRICK • ART DIRECTION: JOHN CROMIE • PHOTOGRAPHY: RAMONE MORENO • ILLUSTRATION: JOHN CROMIE

Watch Your P's When Looking for Sandpaper

Q In my local hardware store, I noticed some sandpaper with the letter P before the grit number. What does that signify?

A The P-grade paper assures you of a more consistent scratch pattern because the allowable variation in any given grit size is more tightly controlled. Historically the grit size of paper manufactured in the United States was measured on a scale created by the Coated Abrasives Manufacturing Institute (CAMI). On the CAMI scale, the grit is stated without any additional letters: for example, 120, 180, etc.

In Europe, the allowable variance in grit size is more tightly controlled. Sandpaper made there is graded by the Federation of European Producers of Abrasives (FEPA), which uses the letter P to distinguish its grading system.

The thing to watch for is that the two systems diverge as the grits grow finer (see chart). Not all manufacturers add the P designation to their papers. Here's how the major players label their sandpapers: 3M always uses the P on its FEPA-graded paper. Norton uses FEPA for all but its silicon-carbide paper, but does not display the P. European companies, such as Klingspor and Mirka, only offer FEPA paper and almost always show the P designation.



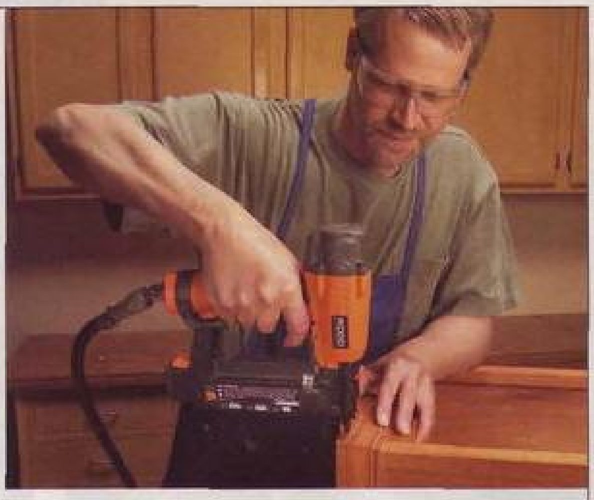
Little discrepancy occurs between the two grading systems from the coarsest grits up to 180 grit. However, as the grades become finer than 180 grit, the two systems diverge markedly. When using the finer grits, it is important that you know which grading system is used.

If you have a question you'd like answered, send it to us at **Question & Answer, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121 or e-mail to qanda@readersdigest.com.** Sorry, but the volume of mail prevents us from answering each question individually.

Abrasive Grading

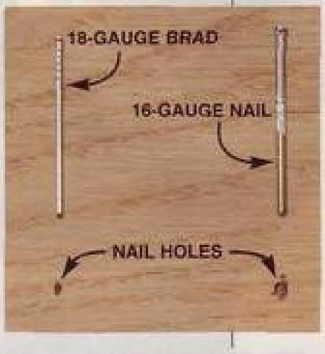
FEPA	CAMI
P24	
	24
	30
P30	
	36
P36	
	40
P40	
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P50	
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P600	
	400
P800	
	500
P1000	
	600
P1200	
P1500	
	800
P2000	1000

Brad Nailer vs. Finish Nailer



Q I'm ready to buy my first pneumatic nailer. I'm not sure which size gun will suit me better: an 18-gauge *brad* nailer or a 16-gauge finish nailer. Any advantages to one over the other?

A An 18-gauge brad nailer is the best all-around nailer for cabinet work. Brad nailers leave smaller holes and are less prone to split wood than finish nailers are. In making cabinets and furniture, you'll usually depend on glue and clamps to form a structurally sound bond, so finer gauge nails will be strong enough to hold the parts together until the glue sets. These thinner brads are also great for applying trim to cabinets and tacking jigs together. The brads' small size makes them more versatile in the shop

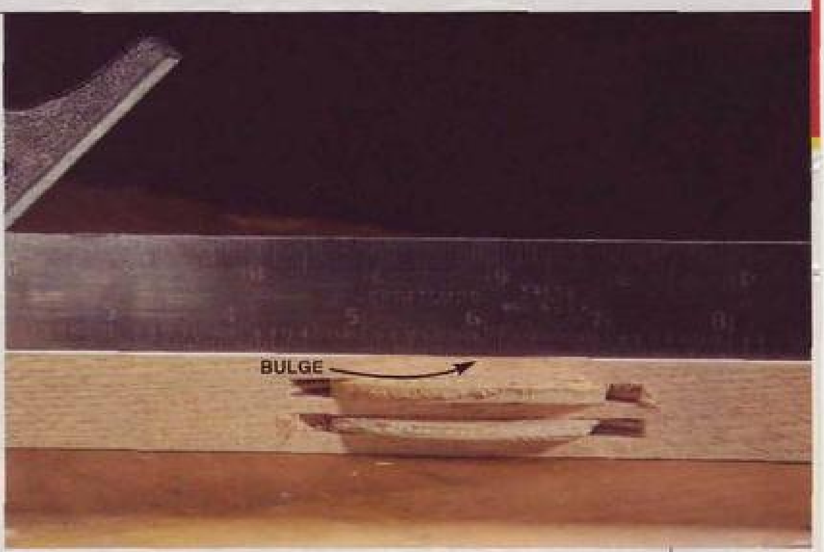


The 18-gauge brads come in a variety of lengths from 5/8 in. to 2 in. The narrow gauge and head on a brad make a small hole that's easily filled. In contrast, 16-gauge finish nails are longer at 1-1/4 in. to 2-1/2 in., are thicker and have larger heads that provide more holding power. They are better suited for carpentry projects, such as putting moldings up on a wall.

Department of Corrections

In the "Trophy Coffee Table" story (AW #122, July 2006, page 63), we mistakenly advised using a filler to thicken the epoxy for filling cracks. The epoxy with filler will dry to an opaque amber or off-white color, depending on how much filler is added. Instead, we recommend using straight epoxy to fill cracks and small voids. It will dry to a clear amber color. You may need to dam up cracks and voids to prevent the epoxy from running out.

Prevent Biscuit Pucker



Q Recently, I joined a frame using double biscuits. As I was finishing the cabinet, I noticed small depressions at some of the joints. What gives?

A The depressions you see are a caused by biscuit pucker. This phenomenon usually results from placing a biscuit too close to the board's surface. Biscuits are made from compressed beechwood designed to expand when introduced to moisture from glue. If you use a lot of glue in the slot, the excess moisture may also cause the surrounding wood to swell. As the biscuit and the wood around it expand, a bulge may develop at the surface. When you sand the board, you shave off the bulge. Eventually, however, as the wood dries, it shrinks back to its original size, leaving in the board's face a slight depression called biscuit pucker.

There are a few ways to prevent this from happening:

1. Make sure your biscuit slots are at least 1/4 in. from the surface. Double biscuits do make a joint strong, but take care when using them in 3/4-in. material. You should stack the biscuits close together in the center of a 3/4-in. board.

2. Let the joint completely dry—usually two or three days—before you sand or plane it.

3. If you are using the biscuits primarily to keep the joint in alignment, use single biscuits. Apply glue only to the surfaces to be joined, not to the biscuits

edited by Brad Holden



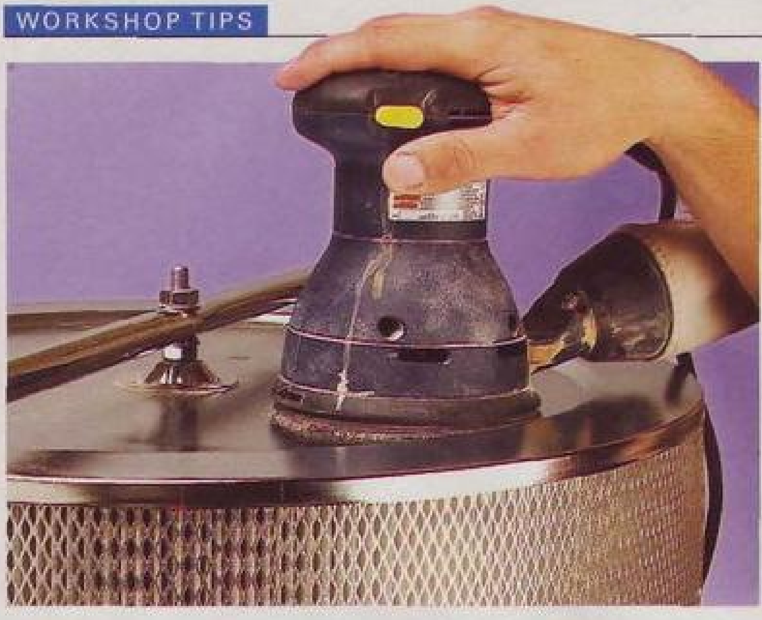
Overhead Clamp Rack

Storage space is limited in my shop, so my pipe clamps hang from the ceiling. I made this rack from 3/4-in. plywood and attached it to the ceiling joists with 3-in. decking screws. A center block prevents the handles from rotating when I slide them in from one end. This way, the clamps won't fall out of the slot. My 20-in.-long rack holds 12 clamps.

Frank Muhvich

A	5-1/4" x 20"	C	3" x 20"
B	3-1/2" x 20"	D	2-1/2" x 20"

EDITORS: TOM CASPAR AND TIM JOHNSON • ART DIRECTION AND PHOTOGRAPHY: VERN JOHNSON



Random-Orbit Filter Cleaner

I've had my canister-filter dust-collection system for about two years. It works great, but I figured out a new way to get it super clean.

Some high-end shop vacuums clean their filters using a built-in vibrator. I asked myself, "Why not adapt this idea?" The last time I emptied my dust collector, I cleaned the filter as recommended by the manufacturer by rotating the internal flappers two or three times. Then I removed the sandpaper from my random-orbit sander and placed a small piece of material cut from a nonslip router pad under the sander. I used the sander with very light pressure to vibrate the canister's top and sides. A lot more dust shook out of the filter in just a couple minutes.

Lou Bush

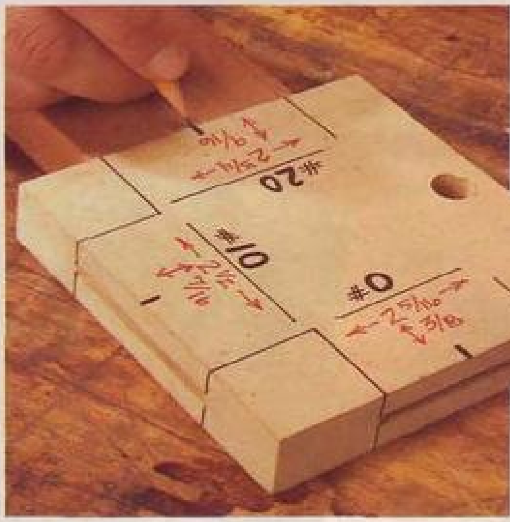
Treat Sharpening Stone Water

Waterstones have always been my preferred method to produce a razor-sharp edge. I store them in a plastic tub filled with water, so they're always ready to go. In warm weather, the tub and stones can become rather slimy. To prevent this, I add a capful of bleach when I replenish the water.

Tim Johnson



Biscuit Gauge



I use my biscuit joiner all the time to quickly make strong joints. With narrow boards like face frames, I used to spend a lot of time figuring out which biscuit size to use so the slots wouldn't be too wide and show. To avoid all that recalculation, I made a permanent reference block.

I cut slots for No. 0, No. 10 and No. 20 biscuits in a block of wood and recorded all the information I need: the slots' exact widths, depths and centerlines. When locating slots for mitering, I insert a biscuit and note its curvature. This way I avoid cutting slots too close to the miter's tip. I drilled a 1/2-in. hole through the block to hang it over my bench, but I often keep this handy tool in my apron pocket.

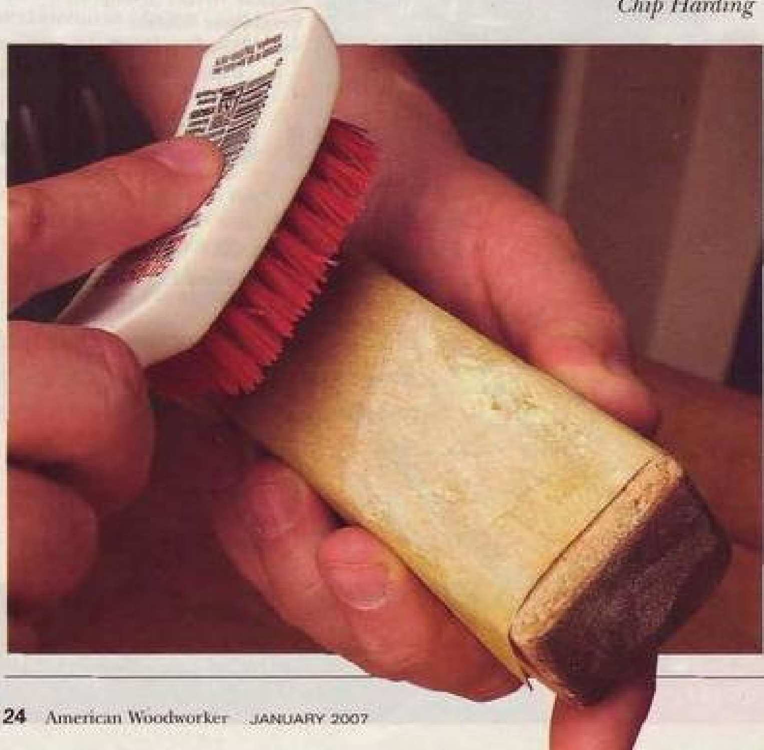
Serge Duclos

Sandpaper Saver

Sanding between coats of polyurethane is tough on sandpaper. And I make it tougher, because I never wait the recommended 72 hours before recoating. But if the finish isn't bone-dry, the paper is likely to gum up.

When my sandpaper loads up, I clean it using my trusty stripping brush. Its firm nylon bristles remove the gum without wearing out the grit.

Chip Harding



WORKSHOP TIPS

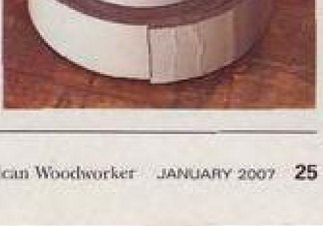
Magnetic Clamping Pads

C-clamps can make nasty dents that are tough to sand out. Pads or blocks will prevent this, but they're often awkward to hold in place while you tighten the clamps. I make pads that don't require extra hands.



I bought a roll of 1-in.-wide adhesive-backed magnetic strip from a craft store and cut off a number of long lengths. I adhered these strips to 1-1/4-in.-wide pieces of 1/4-in. plywood. Using a miter saw, I cut these pieces into shorter lengths as needed to fit the C-clamp jaws. I store my magnetic pads on a steel strip that I screwed to the end of the bench. The pads are ready to go whenever I need them.

Peter Smith





Duct-Taped Sanding Block

Sometimes I prefer to sand by hand using a rubber block. This method gives me a better feel for the work than using a random-orbit sander does. Blocks like mine have been around for many years, but I believe I've made an improvement.

I had noticed that most of the work was done by the paper's leading edges. The paper's center didn't seem to have any wear at all. To compensate, I stick a piece of duct tape to the bottom of the sanding block, not quite reaching the ends, before I attach the sandpaper. The tape allows me to apply even pressure across the block's entire surface, but it isn't thick enough to spoil the block's flatness.

John Vasi

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by George Vondriska

Woodworker-Friendly Drill Presses

For eons, woodworkers have had to abide with drill presses designed primarily for metalworking. But no more, thanks to new woodworking drill presses from Delta and Powermatic. Both machines have super-wide tables that are easy to clamp to and provide better support for long pieces, such as table legs or cabinet sides. Their tables have replaceable center inserts for blow-out-free exit holes and miter slots for attaching jigs and fixtures.

Both machines have lasers that pinpoint the center of the hole, digital rpm readout and mechanical variable-speed control systems that make it easy to dial in the proper speed for the bit and the material.

The Delta 20-959LX ($949) has two speed ranges, from 150 to 1,100 rpm and from 500 to 3,200 rpm. Its super-low speed capability is great for large-diameter Forstner bits. In addition to indicating speed, Delta's digital readout also indicates drilling depth, which is helpful when you want to drill stopped holes. Its impressive 24-in.-wide x 14-in.-deep table tilts up to 45 degrees forward, as well as left and right. Forward tilt adds versatility. For example, it's useful for drilling angled holes in long pieces that otherwise would hit the column. The 20-959LX is a large machine, with a 20-in swing, a 6-in. stroke and a 1-hp motor. It comes equipped with an adjustable incandescent task light. A fence is available as an accessory.

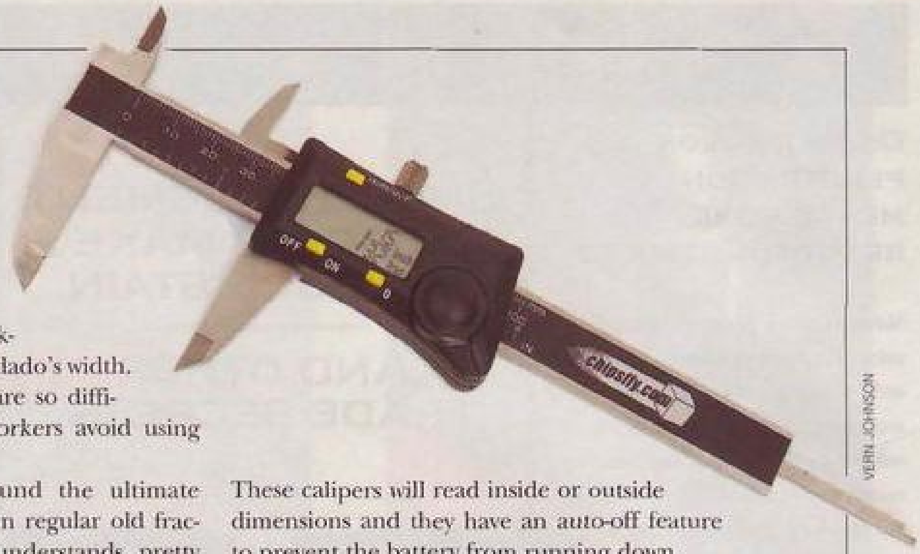
The Powermatic 2800 ($799) comes with an adjustable fence and a keyless chuck that works great and has enough bite to hold large-diameter Forstner bits. Its 16-in. x 14-in. table tilts left and right and expands to 26 in. wide with the wings open. This machine has an 18-in. swing, a 4-3/8-in. stroke and a 1-hp motor. Its variable-speed setting ranges from 400 to 3,000 rpm. It comes with built-in LED work lights and quill handles that can be mounted on the left or right side of the head.



Sources Delta Machinery, (800) 223-7278, www.deltamachinery.com 20-959LX drill press, $949. • Powermatic, (800) 274-6848, www.powermatic.com 2800 drill press, $799.

EDITOR: TIM JOHNSON • ART DIRECTION: JOHN CROMIE • PHOTOGRAPHY: MANUFACTURER, UNLESS NOTED

DIGITAL CALIPER READS IN FRACTIONS



Calipers are handy to have in any shop. You can use them to check a board's thickness, a drill bit's diameter or a dado's width. Unfortunately, most calipers are so difficult to decipher that woodworkers avoid using them like they avoid sanding.

Stop the presses—I've found the ultimate caliper. It's digital and reads in regular old fractions, something my brain understands pretty well. To use it, you don't have to convert decimal readings, just read the display. It's wonderfully simple, and at $38, it's competitively priced.

These calipers, available with 4-in. or 6-in. capacity, can be zeroed at any position, which allows you to measure the difference in thickness between two items without doing fractional math. These calipers will read inside or outside dimensions and they have an auto-off feature to prevent the battery from running down.

Oh, one more thing: If you like, you can change the display to read in decimals as small as thousandths or in millimeters, allowing you to measure to 1/64 in., .0005 in. or .01 mm.

Source The Craftsman Gallery, (866) 966-3728, www.craftsmangallery.com Fractional caliper, 4-in., #30-144, $38; 6 in., #30-145, $38.

MAGNETIC HOLD-DOWNS SWITCH ON AND OFF



Ever get stuck trying to figure out how to fasten a jig or featherboard to a cast-iron tabletop? Sure, sometimes you can use the miter-gauge slot, but it's not always convenient. If you've ever had this problem, new products from Magswitch will really grab you—along with any ferrous surface you put them on.

Magswitch components contain rare earth magnets that you turn on or off by rotating a knob. Simply put, the knob aligns or offsets the polarity between two rare earth magnets within the jig. Trust me, when the polarity is aligned, these babies have an unbelievable amount of grabbing power.

Mag-Jigs (see photo, top) are designed for use in any shop-made jig with a 3/4-in.-thick base. Most jigs will require two Mag-Jigs. Just bore holes through the base, install the Mag-Jigs and fasten them with screws. Remove the Mag-Jigs, and they're ready for use in another jig. To use Mag-Jigs in stock thinner than 3/4 in., you'll have to shim under their top flanges.

Mag-Jigs are available in 20-mm-dia. and 30-mm-dia. sizes. I suggest buying the larger size, figuring that it's impossible to have too much holding power.

Magswitch featherboards (see photo, bottom) are made with the same switchable magnet technology. Simply position the featherboard and turn the knob. Voilà! The featherboard is rigidly locked in place.

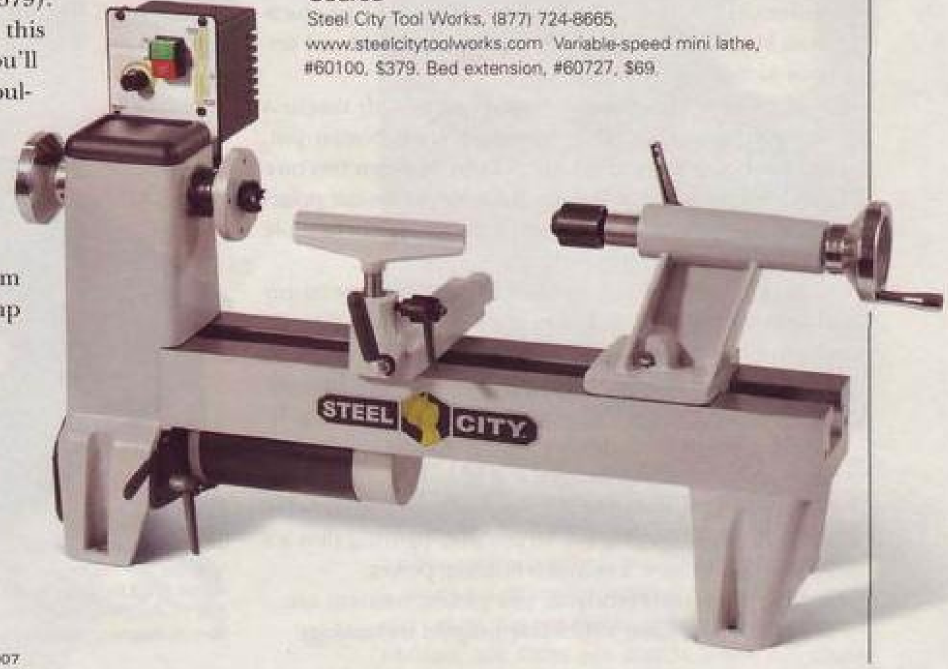


Source
Magswitch,
(303) 468-0662,
www.magswitch.com.au
Mag-Jig, 20-mm dia.,
#M06004, $26. Mag-Jig, 30-mm dia., #M06005, $34.
20-mm magnetic featherboard, #10327, $39.
30-mm magnetic featherboard, #10328, $49.

Variable-Speed Mini Lathe

Although the market is loaded with mini lathes, few of them offer the convenience of variable speed. Enter Steel City Tool Works' variable-speed mini lathe ($379). Once you start controlling this lathe's speed with its dial, you'll never want to go back. A step pulley is used to set speed ranges, high and low, and the speed dial takes over from there. The low range goes from 500 to 1,350 rpm, and the high range from 1,400 to 3,800 rpm. A 1/2-hp motor supplies the power.

The Steel City machine has a 10-in. swing over the bed and 15-in. capacity between centers. Adding a bed extension increases the capacity to 37-3/4 in. The drive spindle is 1-in. diameter with 8 threads per inch (tpi). Both the head and tail stock take a No. 2 Morse taper.



Source

Steel City Tool Works, (877) 724-8665, www.steelcitytoolworks.com Variable-speed mini lathe, #60100, $379. Bed extension, #60727, $69.

VERSATILE TENONING JIG *by* Tom Caspar

A tenoning jig is one of my favorite tablesaw accessories. I use it for many different joints, including straight tenons, angled tenons, bridle joints, splined miters and scarf joints. When I recently reviewed these handy tools, I overlooked an impressive model from General International (see "Tenoning Jigs," AW #123, September 2006, page 84, or www.americanwoodworker.com/tenoningjigs).

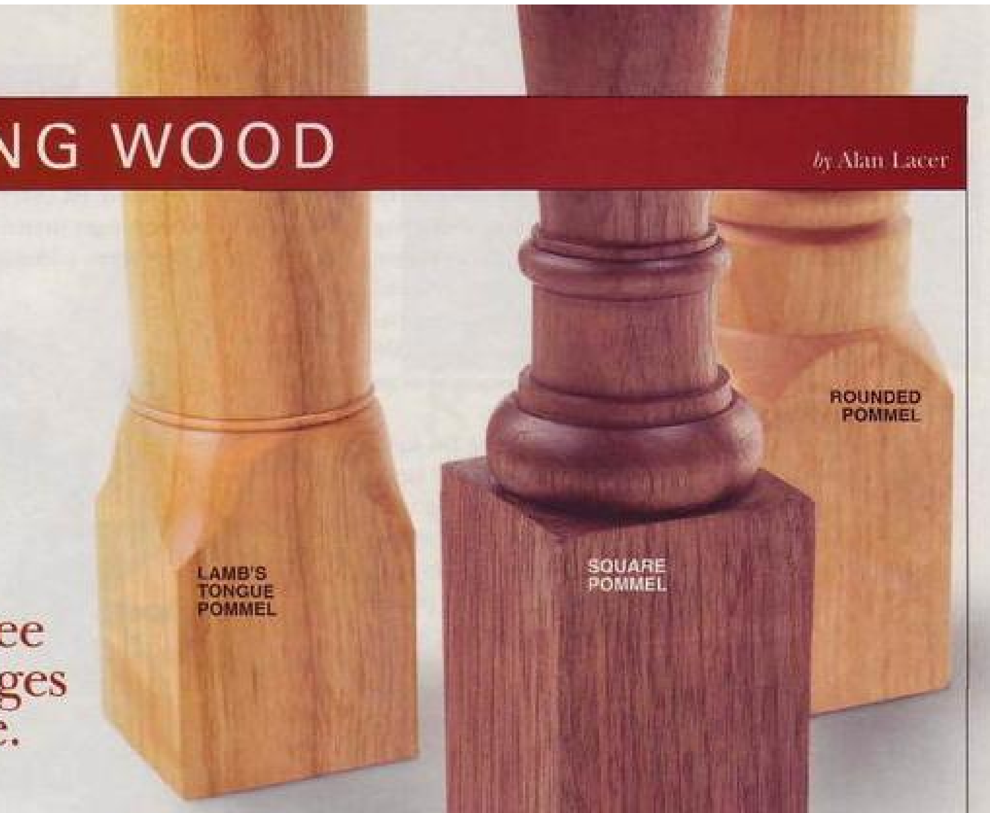
This jig ranks with the best. Its guide bar fits tight to any miter-gauge slot using spring-loaded ball bearings in the bar's side. Precisely aligning the jig with the saw blade is easy because the guide bar's adjustment screws are readily accessible. Both handles may be mounted on the jig's sliding table, which I prefer to do to avoid jiggling the work support during a critical cut.

But that's not all. You can tilt the jig's work support as much as 45 degrees, considerably more than the 17-degree maximum on other jigs. Unlike other jigs, with this one, you can reposition the clamp arm and backstop to either side of the work support. This allows you to use the jig on the left or right side of the blade for an even greater range of angled cuts. In addition, this jig's coarse table adjustment works very smoothly, much better than those on other jigs, and its cast-iron base is huge—2 in. longer than other jigs' bases. All in all, this jig is an excellent addition to your tablesaw.

Source General International, (514) 326-1161, www.general.ca Tenoning jig #50-050, $119.



by Alan Lacer



Make splinter-free square edges every time.

Perfect Pommels

A pommel is any area left square on a turning. You'll find pommels on table legs, balusters, porch columns and other furniture parts. A pommel can have an abrupt square shoulder or a gently shaped shoulder as it meets the rounded section of the turning. Using the wrong tools and technique can easily reduce each of these corners to splinters. Many new turners approach pommels with fear and trepidation, but the correct technique is not hard to learn. Follow each step described here and with a little practice, you'll be cutting great-looking pommels every time.

I use two tools to make pommels: a skew chisel and a detail gouge (see photo, right). Many skews have a straight edge that runs at a diagonal, but mine is different. I shape my skew so the cutting edge near the long point is square across. From there, the edge curves down to the skew's short point. This shape is a bit more versatile and forgiving in tight situations.

I use a detail gouge to shape the shoulders of a pommel. This tool's rounded profile is easy to roll from one position to another while supported on the tool rest.

Pommels have three primary variations: square, rounded and lamb's tongue (see photo, above). To make each type, begin by creating square shoulders. Next, shape one of the variations, if desired. You'll turn the rest of the leg or baluster after the pommels are done.

Tools You'll Need

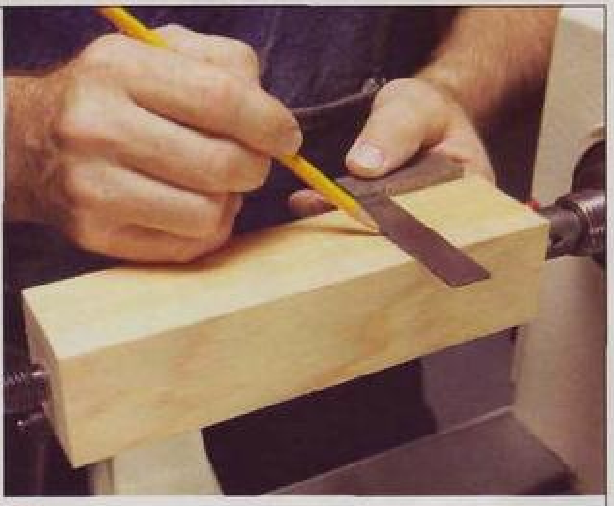
The best tools for shaping a pommel are a skew chisel and a detail or shallow gouge. Many skews have straight edges, but I prefer a rounded edge with a short straight section. This profile is easier to use and more versatile. I'll show you how to create it in the next issue.



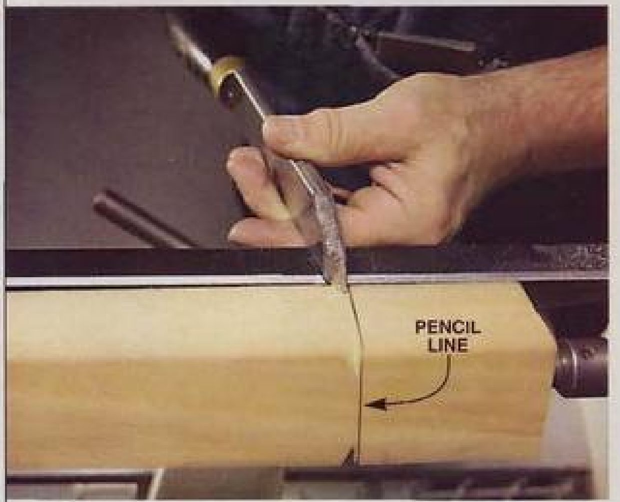
EDITORS: DAVE RADTKE AND TOM [illegible] ART DI[illegible] SIMPSON • PHOTOGRAPHY: BILL ZUEHLKE, UNLESS NOTED



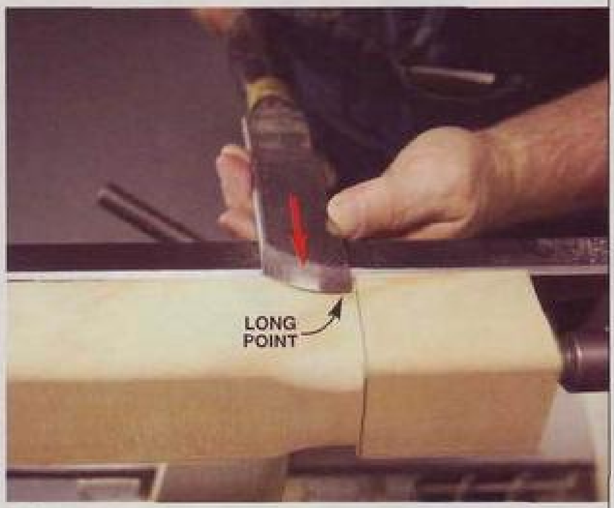
1 Scribe lines to find the precise center of your leg stock. This ensures that square and rounded sections will be centered; if they're not, the rounded sections will appear offset.



2 Mark the pommel's end with a pencil line or two. The darker the line, the easier it will be to see when the leg is turning.



3 Cut a V-shaped groove 1/8 in. from the pencil line. Hold the skew's handle low and its long point down, high on the workpiece. Slowly lower the point into the spinning corners to begin making one side of the groove. When you feel resistance, make another cut from the other side to complete the V groove.



4 Peel away the waste. With this cut, the skew is flat on the tool rest, its handle is low and the long point is facing the pommel. Cut to the bottom of the V groove. Alternate between deepening the V shape and the peeling action until you are close to a round cylinder.

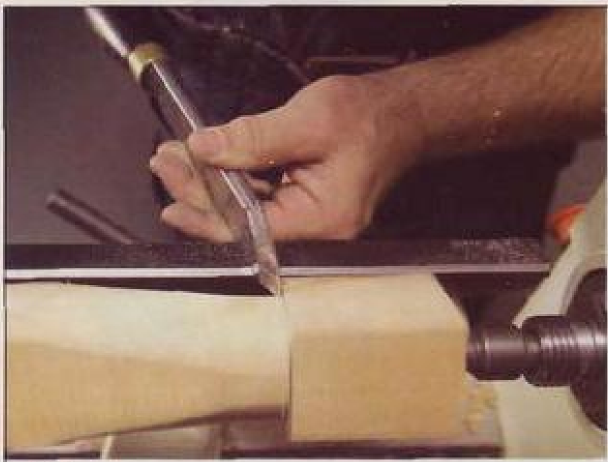
Prepare Your Stock

Your stock must be perfectly square. Locate precise centers at both ends by marking diagonals with an awl (Photo 1). Mount the workpiece onto your lathe. Use a square to draw a dark pencil line where you'd like your pommel to end (Photo 2). If you're working with a dark wood, mark two or more faces or use a white pencil to make the lines visible.

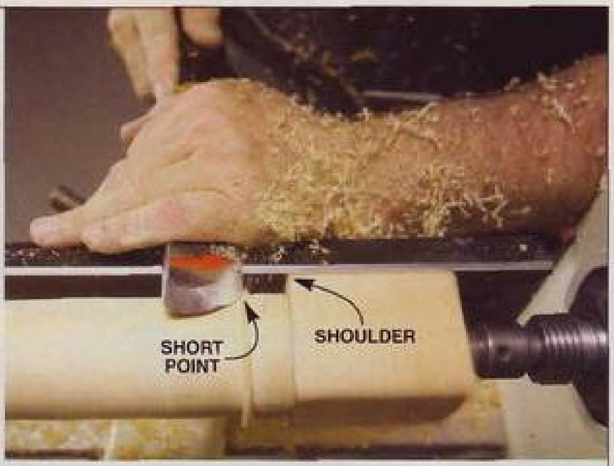
Cut a V Groove

Adjust your lathe to a moderate speed of 900 to 1,200 rpm. Position the skew on the tool rest, long point down, and cut into the workpiece about 1/8 in. from your pencil line (Photo 3). Aim the skew toward the turned side, the portion that you'll form into a cylinder later. This first cut won't go very deep. To form the V groove, reposition the skew slightly farther away from the line and cut in from the turned side back toward your first cut.

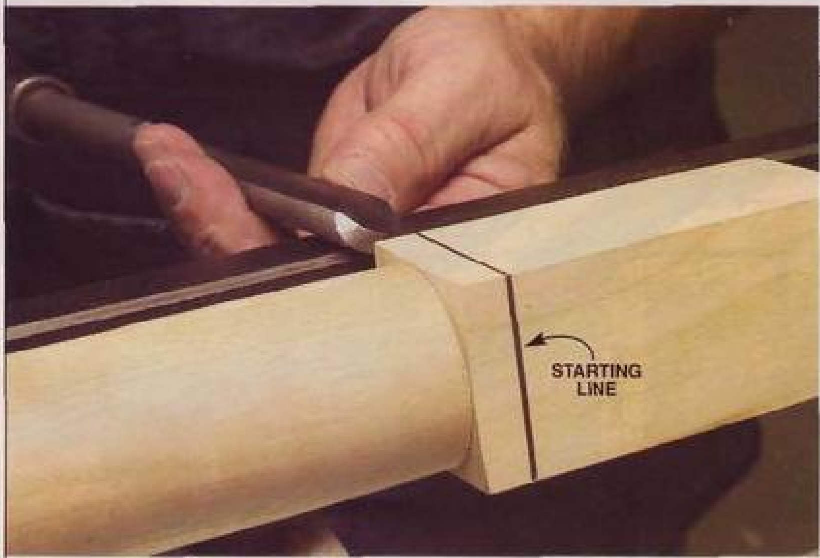
Now, remove wood from the turned side using the skew's long point. Peel the wood back toward your V cut, but not deeper (Photo 4). The turned side will begin to resemble a cylinder but still have flat sections. Go back and deepen the original V cuts, and then remove more wood from the turned side. Repeat this process until you are very close, about 1/16 in., to the round diameter of your stock.



5 Define the pommel's end with the skew's long point. Cut down near the pencil line with the skew angled slightly away from the pommel. Sneak up to the pencil line with a series of small cuts.



6 Plane away the waste up to the shoulder. Flip the skew so the short point faces the pommel. Cut most of the waste using the skew's lower section. Use the short point to cut right up to the pommel.



VERN JOHNSON



VERN JOHNSON

7 Use a detail gouge to round the pommel. Begin with the flute facing up, the handle low and the gouge's bevel rubbing on the area to be cut. Roll the gouge over while lifting the handle (see photo, above). Continue to rub the bevel on the wood. Repeat this process with light cuts until the pommel is rounded.

Define the Pommel

Now you're ready to create the pommel's actual shoulder. Place your skew on the tool rest with the long point down and handle low. Cant the skew blade a few degrees away from the pommel. Raise the back of the tool handle to bring the skew into the wood at the pencil line and slice away a very small amount of wood (Photo 5). Remove the wood with several light cuts, rather than one or two heavy cuts, to avoid tearing the corners. If your goal is a square pommel, be sure you cut perpendicular to the line.

When you've reached the full rounded diameter of the stock, use the skew to plane from the round portion up to the pommel's shoulders (Photo 6). The squared-off pommel is complete. If you choose not to round the shoulders, you can complete the rest of the turning.

Shape the Rounded Pommel

Precise starting and stopping points of shaped pommels' shoulders are critical, especially when turnings are placed closely together, such as stair balusters. Mark the shoulder's starting point in the same manner that you marked its stopping point.

Start the cut with the flute or hollow of your gouge pointed upward (Photo 7). Roll the tool over onto its side and advance it slightly toward the edge of the pommel to create the curve. Repeat this action in a series of light cuts, advancing from the starting line to the end of the pommel, until you've defined the shape. If you're making a lamb's tongue, shape an ogee rather than a roundover.

Remove the tool rest. With the workpiece spinning, lightly sand the rounded portions of the pommel with 180-grit or finer sandpaper.

by Richard Tendick



11 Tool Upgrades

Improve your tools' performance with aftermarket accessories.

1 Bandsaw Fence

You can get a lot more out of your bandsaw by adding a fence. It enables you to make straight rip cuts, stand boards on edge to resaw them into matching pieces and accurately cut tenons and half-lap joints.

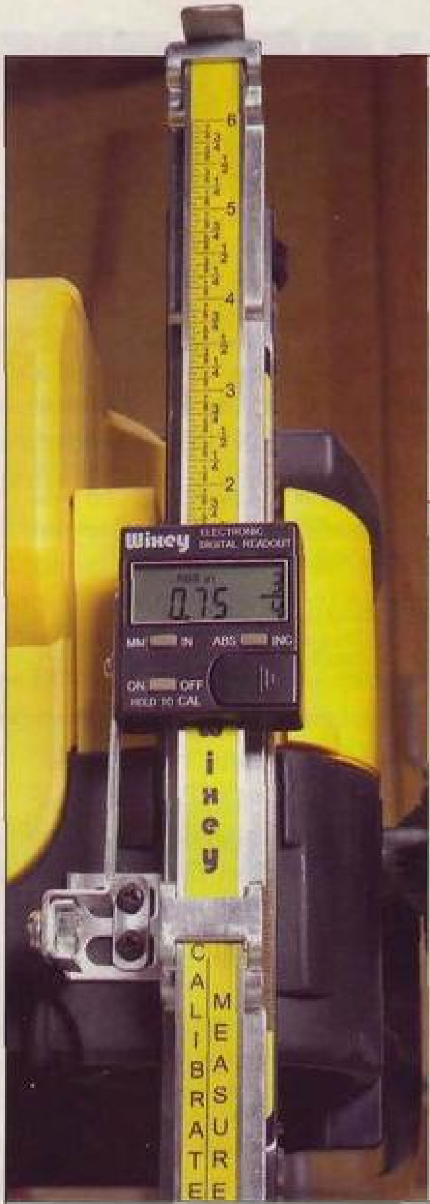
A good fence should be rigid, position and lock down easily, have an accurate cursor and, most importantly, adjust for blade drift. Many manufacturer-supplied fences for 14-in. bandsaws score well on three counts, but not on blade drift. They're awkward or impossible to slightly skew right or left, which is often a necessary adjustment to produce a long, straight rip cut.

One aftermarket fence, however, has just about everything you could ask for. It's made by Kreg. This fence won't flex or creep under resawing pressure. It slides effortlessly. The scale and cursor are as accurate as a T-square tablesaw fence. Simply loosening two bolts allows you to set the drift angle. Three additional accessories are very handy: tall and short curved resaw guides, which allow you to resaw without adjusting for blade drift, and a micro-adjust mechanism to fine-tune the fence setting.

The Kreg fence fits on most 14-in. saws, but you may have to drill some holes on your table's side to mount it.

Source Kreg Tools, (800) 447-8638, www.kregtools.com Bandsaw fence, #KMS7200, $120. Micro-adjust, #KMS7215, $15. 4-1/2-in. resaw guide, #KMS7213, $18. 7-in. resaw guide, #KMS7214, $20.

EDITOR: TOM CASPAR • ART DIRECTION: DAVID SIMPSON • PHOTOGRAPHY: RAMON MORENO



2 Digital Planer Scale

If you have trouble reading your planer's scale, join the club. There is a solution, though: a digital scale. With incredible precision, a digital scale tells you exactly what you're going to get.

The Wixey Digital Readout reads out in both fractions and thousandths of an inch. The scale is easy to calibrate and can be zeroed out at any thickness. Need to take .007 in. off a board you've just planed to fit it into a groove? No problem. Set the Wixey to zero, turn the planer's handwheel until the readout says .007 and plane the board. No math involved. This device attaches to most planers. Visit the company's Web site for details.

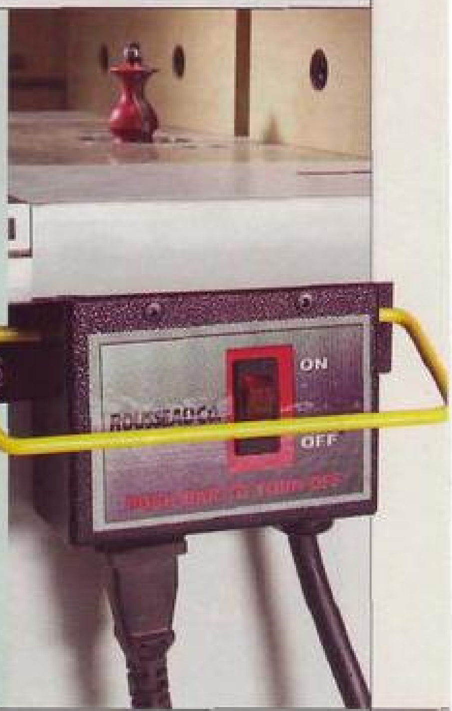
Source Wixey, www.wixey.com Electronic Digital Readout, #WR500, $60.

3 Router-Table Power Switch

It's no fun to fumble under a router table, trying to locate your machine's power switch. It's much easier to install a new switch, outside the table. And if you can slam it off in a pinch, so much the better.

This switch doesn't require any special wiring. You plug your router into it and then plug the switch's cord into a wall outlet. Turn your router's switch to the on position and you're all set. Now, when you're ready to rout, flip the small switch on the side of your table. When you're done, push the big yellow bar to turn the power off.

Source Woodcraft, (800) 225-1153, www.woodcraft.com Safety power switch, #141938, $39.



4 Better Guide Blocks

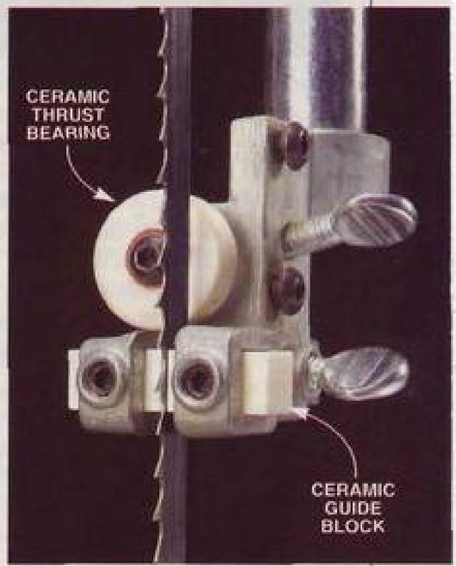
Heat, the silent killer of bandsaw blades, can distort a blade and affect its tracking. Ceramic guide blocks produce much less friction and heat than do the steel blocks commonly found on older saws. If you replace steel blocks with ceramic blocks, your blades will last longer and perform better.

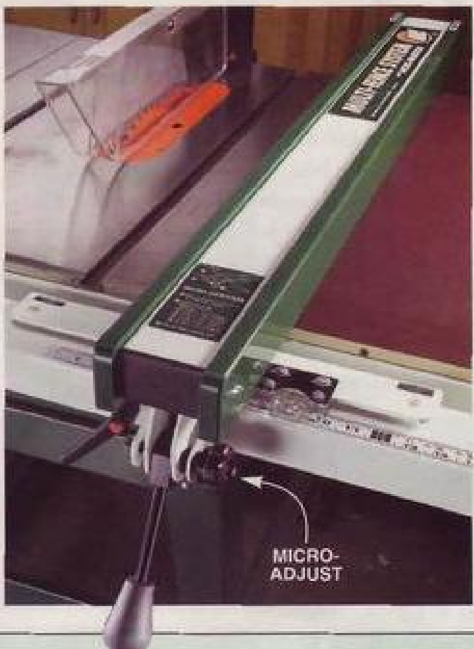
Phenolic Cool Blocks also cut down on heat build-up, but they become uneven with wear. Their relative softness makes them a good choice for 1/4-in. and smaller blades because they won't damage the blades' teeth.

Ceramic blocks are much tougher than phenolic ones and will stay flat for a very long time. They might damage the teeth on a small blade, so use ceramic blocks for 3/8 in. and larger blades.

You can also buy ceramic thrust bearings for many saws. Unlike standard bearings, ceramic bearings will never seize up, because they're not meant to rotate. Check the Web site (see Source, below) to learn whether these blocks and thrust bearings will fit your machine.

Source Woodworker's Supply (800) 321-9841, www.pro.woodworker.com Ceramic block set, $19. Thrust bearings, $19. Cool Blocks, $15.





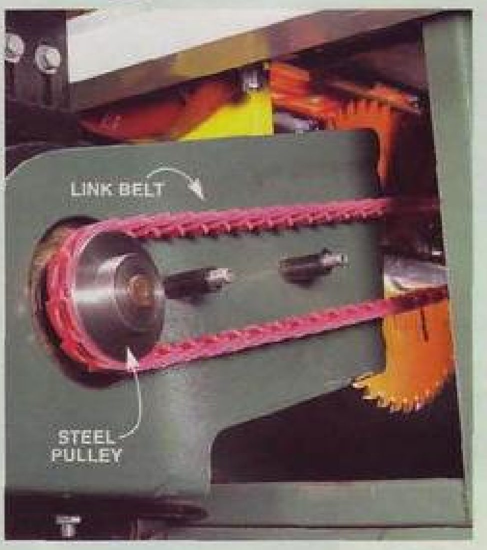
5 T-Square Fence

Using a ruler to set your old-style fence is a headache you don't have to put up with. If you've got a perfectly good saw with a crummy fence, replace it with a T-square-style fence.

T-square fences are easy to use. A scale on the front rail indicates the fence's precise distance from the blade. After you adjust it, a T-square fence will automatically lock down parallel to the blade every time. This gives you the smoothest cut possible.

Virtually every new contractor's or cabinet saw comes with a T-square fence because it's so simple and reliable. Most of these fences probably won't fit older saws, however. HTC makes a T-square fence specifically designed to retrofit a wide variety of saws. The HTC fence is just as good as the best fences on new saws. It also has an effective micro-adjust feature that allows you to minutely shift the fence left or right.

Source HTC Products, (800) 624-2027, www.htcproductsinc.com
Contractor multi-fence system, 800 series, 30-in. rails, $380; 50-in. rails, $400.
Commercial multi-fence system, 30-in. rails, $427; 50-in. rails, $460.



6 Tablesaw Drive Belt and Pulleys

If your contractor's saw vibrates like crazy, producing ragged cuts, then replacing its drive belt and pulleys may solve everything.

This drive belt from In-Line Industries is different than the type you normally see. It's composed of a series of interlocking links that make the belt flexible enough to absorb vibrations from the motor. The links easily come apart. Remove as many as you need to match the length of your old belt.

Check out the pulleys on your saw, too. If a magnet won't stick to them, they're die cast. Die-cast pulleys wear easily and may not be perfectly round, which can also produce vibration. Replacement pulleys from In-Line are machined steel, guaranteed round and longer-lasting. See In-Line's Web site for a list of the saws that the pulleys will fit.

Source In-Line Industries, (800) 533-6709, www.in-lineindustries.com
Contractor Saw Performance Kit including pulleys and belt, $50. Belt only, $7 per foot.

7 Miter-Saw Flip Stop

Adding a fence and a stop takes the guesswork out of measuring cuts on your miter saw. You can make your own, but one commercially made system has every feature you'll need.

The system has two parts: the Top Trak, an aluminum extrusion that screws to the top of a shop-made wooden fence, and a flip stop. They're sold separately by Kreg. The Top Trak can be cut to any length to fit your saw setup. It accepts a self-adhesive rule (not included) that can run right to left or left to right. The flip stop, which slides on the Top Trak, has an adjustable cursor for reading the rule. The stop flips up and down for quick, repetitive cutting and can be set up for either side of your saw.

Source Kreg Tools, (800) 447-8368, www.kregtools.com Top Trak, 4 ft., #KMS7714, $35. Kreg flip stop, #KMS7801, $30. Adhesive rules, right to left, #KMS7723, or left to right, #KMS7724, $8.





8 Compressed-Air Router Base

Imagine a huge, heavy router effortlessly gliding along on a thin cushion of air. That's what the folks at Art Betterley designed for commercial solid-surface and laminate workers to avoid scratching their material, but any woodworker can benefit from this new router base.

The base rides on compressed air that comes in through a hose and valve and goes out through a series of holes under the base. The air elevates the router a mere .001 in., making it easy to push or pull. In addition, the air blows away the chips. Workers in the field who've tried the base have told the company both factors add up to a cleaner, smoother cut in Corian products, laminate or wood. This base fits a number of large routers with 6- or 7-in.-dia. bases; on the company's Web site, you'll find a list of specific models.

Source Art Betterley Industries, (800) 871-7516, www.betterleytools.com Air Glide router base, 7-in. diameter, #AG-7000, $150.



9 Steel Faceplate

Heavy cuts put lots of stress on a faceplate. When you turn a large bowl from a big blank, the aluminum or cast-iron faceplates typically supplied with a lathe may not be able to stand up (or be the right size). You're much better off using a correctly sized faceplate made from solid steel.

A good faceplate should have numerous holes for mounting a large, heavy blank. In addition, it should be powder coated or made from stainless steel to resist rusting from the water in a green blank.

Faceplates made by Oneway Manufacturing perfectly fit the bill. They're available in a number of diameters and thread sizes.



Source Packard Woodworks, (800) 583-8876, www.packardwoodworks.com Oneway steel faceplates, $43 to $63.

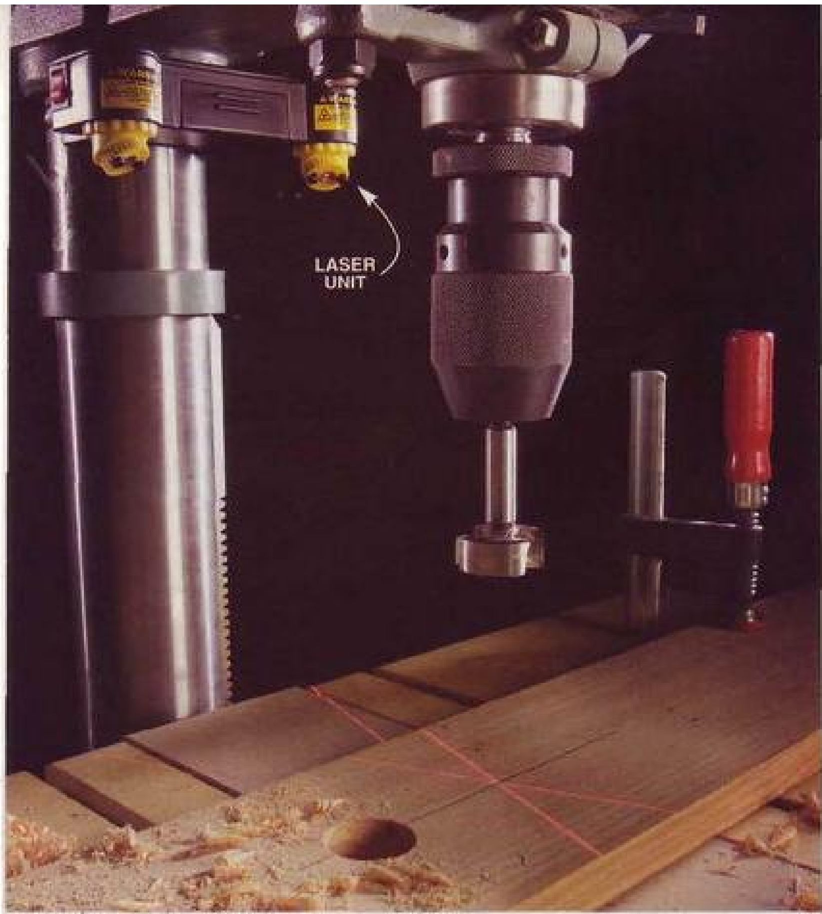
10 Premium Blade and Chip Breaker

The best way to improve any Stanley-style plane, old or new, is to upgrade its blade. A premium blade will stay sharp much longer than a standard blade and will give better results. Most premium blades are considerably thicker than standard blades. Extra thickness makes a blade stiffer, so it's less likely to chatter when cutting tough wood.

Hock Tools is a small company that specializes in premium blades for many hand tools. Its top-of-the-line plane blades are made from A2 tool steel, the same steel used in the blades of high-quality planes. Hock also offers a premium chip breaker that is thicker than a standard chip breaker. Replacing your chip breaker further reduces blade vibration and chatter. Hock blades and chip breakers come in a variety of widths to fit most planes.



Source Hock Tools, (888) 282-5233, www.hocktools.com A2 plane blades, about $50 ea. Chip breakers, $26 to $38.



TOOL TALK

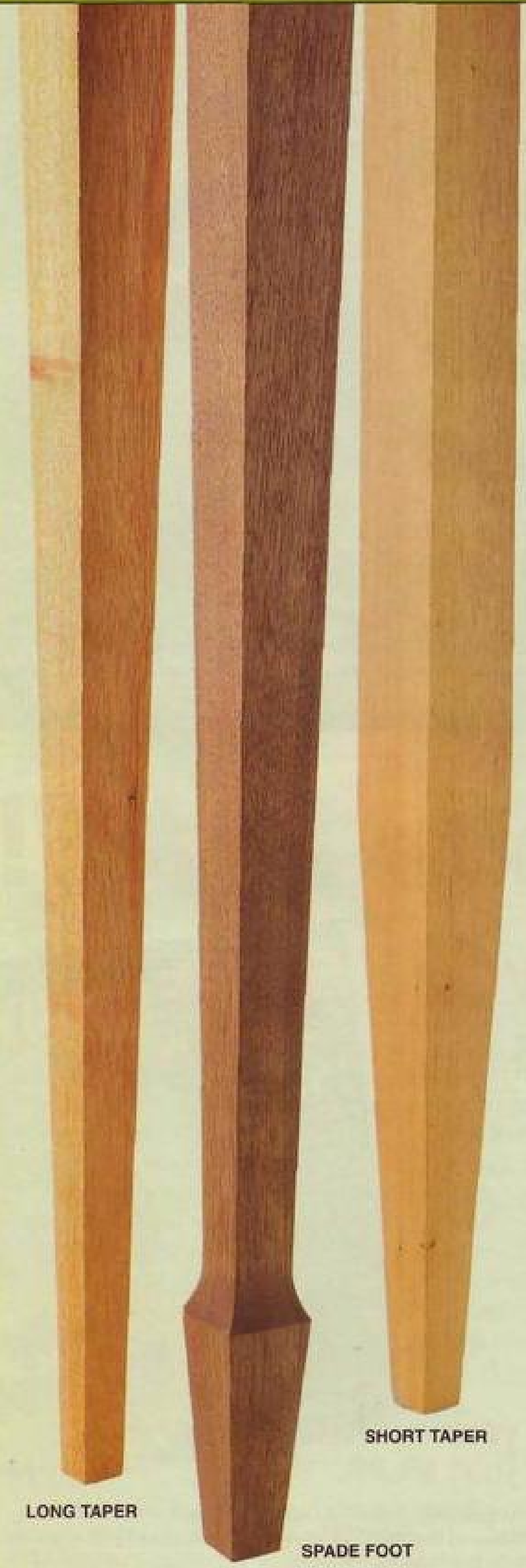
11 Drill-Press Laser Guide

Drilling a hole is easy, but it doesn't always go exactly where you want. Position your mark under the crosshairs of a laser, though, and you can't miss.

Some new drill presses come with built-in lasers, but this guide easily fits on the column of most older drill presses. It's a horizontal bar with a laser at each end. Each laser projects a fan of light that you calibrate using an adjustment jig. The light fan creates a bright red line on your workpiece. The drill bit will always align with the point where the red lines cross, no matter whether your table is adjusted high or low. The guide is powered by a 9-volt battery.

Source Woodcraft, (800) 225-1153, www.woodcraft.com Drill-press laser, #146709, $40.

by Seth Keller



3 Tapered Legs on the Jointer

Advanced jointer techniques yield smooth, consistent tapers.

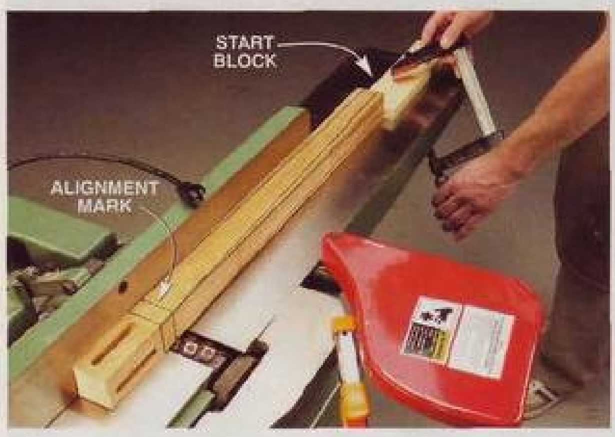
After I learned to cut tapered legs on the jointer, I never went back to my bandsaw or tablesaw. Legs cut on the jointer take less time and, best of all, require a whole lot less sanding. This is especially true with the spade-foot design in which the jointer's cutterhead automatically creates the sweep above the spade foot. The same leg cut on a bandsaw would require hand shaping and sanding to finish the profile.

All three legs shown here are made from 1-3/4 x 1-3/4 x 29 in. stock. The first leg I'll explain how to make is the familiar long taper found in many Shaker designs. Often, this leg has the taper on only two adjoining faces. The second leg has a short taper used on cabinets with legs and on some stylized modern pieces. The last profile, a tapered leg with a spade foot, builds on the techniques used in making the first two legs. This remarkable shape is both elegant and refined. It hints at Hepplewhite and Sheraton furniture designs from the eighteenth century and can make a piece distinctive and stylish even today.

The technique involves dropping a leg down on a running jointer. That may seem a bit scary at first, but stop and start blocks make the procedure safer than with most tablesaw taper jigs I've used and more accurate than for any taper I've done on a bandsaw.

It is a good idea to use a test leg to set up the cuts. As always, mill the mortises before you shape the legs. Finally, make sure your knives are sharp and your jointer is well-tuned.

EDITOR: DAVE MUNKITTRICK • ART DIRECTION: DAVID SIMPSON • PHOTOGRAPHY: MIKE KRIVIT



1 To set the start block, position the leg blank on the jointer with the alignment mark centered over the cutterhead. The alignment mark is placed 1 in. below where you want the taper to begin. Butt the start block up to the leg and clamp the block onto the infeed table.



2 Start the taper cut by slowly lowering the leg onto the jointer with the foot set against the start block. Almost no wood is cut when you first put the leg stock down. The start block prevents kickback. Have your push sticks ready.



3 Create the taper in several passes. Feed the leg slowly over the knives. Use a push block that's taller than the fence to maintain light downward pressure on the infeed table. To keep the cut square, use a push stick to hold the leg tightly against the fence on the outfeed table.



4 Complete each taper with a shallow cleanup pass using the jointer in a traditional manner. Keep the top of the leg pushed tightly against the fence to ensure a square cut.

1 Long Taper

1. Lay out the desired taper on all four sides of the leg. Make alignment marks 1 in. below the top of the taper. My taper goes from 0 in. to 1/2 in. at the foot.

2. Position the start block on the infeed table using the alignment mark as a reference (Photo 1). The start block gives you a consistent start point for each cut and provides a pivot point for safely lowering the leg blank onto the jointer.

3. Set your jointer's depth of cut to 1/8 in. With push sticks ready, turn on the jointer. Place the foot of the leg firmly against the start block. Swing the guard out of the way and lower the leg (Photo 2).

4. Complete the cut (Photo 3). Make three or four passes on the same side of the leg, closing in on your layout line.

5. Rotate the leg 90 degrees into the fence and cut the adjacent taper. Continue until all four tapers have been cut.

6. After all of your legs are tapered, you'll likely see a small divot from the cutterhead where the taper cut begins. To clean this up, remove the stop block and reset the depth of cut to about 1/64 in. Make a single pass on each side to clean up the divot (Photo 4).

7. A little sanding completes the leg.



2 Short Taper

1. Lay out the taper on the leg blank. Construct a sled that angles the leg up on the jointer so the taper line is parallel with the bed (see photo, below).

2. With the jointer turned off, set the cutting depth to about 1/8 in. Place the sled on the outfeed table and swing out the guard. Place the leg on the sled so it is suspended over the cutterhead and rests on the infeed table.

3. Turn the jointer on and make the cut, keeping downward pressure on the foot and the leg where it contacts the sled. (see photo, above). Make three or four passes on the same side of the leg, until the cut reaches the layout line. Rotate clockwise and cut the same number of passes on each side of the leg.

4. Sand the leg smooth.



A simple sled angles the leg on the jointer to create the short taper. Position the leg on the sled so the leg bridges the cutterhead. Slide a piece of 1/2-in. plywood under the top of the leg until the taper layout is parallel with the infeed table. Attach a stop to the sled at that point.

3 Spade Foot and Taper

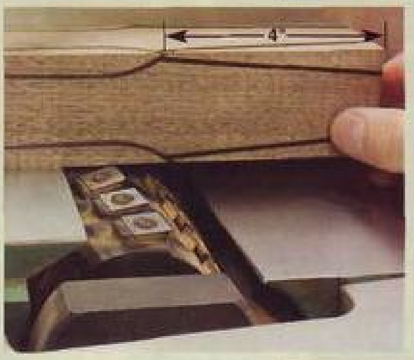
1. Lay out the taper and spade foot on the leg. Unplug the jointer and position a start block as you did for the long taper (see "Long Taper," Photo 1, page 45).

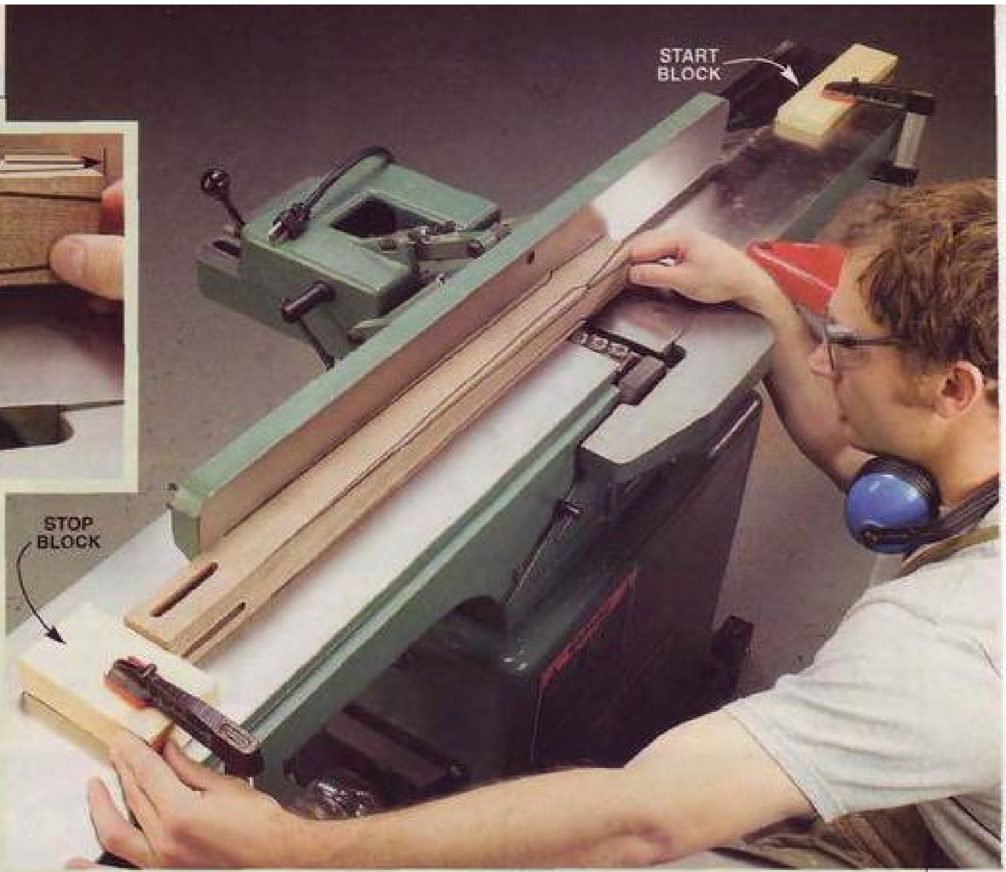
2. Clamp a stop block on the outfeed table (Photo 1). The stop taper is about 1/2 in. deep, so set the depth of cut to 1/2 in.

3. Turn on the jointer. With its foot against the start block, lower the leg and make the cut (Photo 2). Repeat for all four sides. Now you have a stopped taper with a square block on the end. Don't worry if you see some tearout at the top of the foot; it'll be cleaned up when the spade foot is cut.

4. To create the spade foot, remove the start and stop blocks from the jointer. Lay out the spade foot. Make a sled similar to the one used for the short taper. Reset the depth of cut to approximately 1/8 in. and cut the short tapers that form the spade foot (Photo 3). Be sure to hold the top of the leg tightly against the fence to ensure that your tapers start square across the face of the foot.

All that's left is a bit of hand-sanding to smooth the faces and break the edges. With a few passes on a jointer and a little light sanding, you've created an attractive leg with a complex shape.





1 The spade foot starts with a stopped taper. To set the stop block on the outfeed table, position the leg on the jointer so the taper's end aligns with the arc of the cutterhead (see photo, above). Set the start block the same way you did with the long taper.





2 Push the leg over the cutterhead. Slow and steady is the pace to take. You can cut the entire 1/2-in. depth in one pass.

3 Create the foot using the same sled technique you used on the short taper. I added a 3/4-in. board to the short taper's sled to make this sled for the spade foot.

10 Tricks for

Woodworking is sweet when everything fits right. Here are 10 ways to ensure your mortise-and-tenon, dado, dovetail and edge joints close up tightly.

1 Cauls Distribute Pressure

It's not easy to get enough squeeze in the middle of a big box to force home dado or biscuit joints. Big cauls are the answer.

A caul is simply a thick, straight board. I make my cauls from stiff wood, such as hard maple, but any wood will do. The wider and thicker the caul, the less it flexes and the better it delivers pressure far from the clamps. I made a set of eight, each measuring 1-3/4 x 3 x 24 in., to have around the shop whenever I need them.

Stout cauls like these should provide plenty of pressure, but you can get extra pressure in the middle by inserting one or more shims (I use playing cards). You can also round or taper one of the caul's edges from the middle to each end to create a crown. I do a dry run with cauls top and bottom, without shims, and place a straightedge on the cabinet to see whether the sides are flat. If one side bulges and needs more pressure in the center, I loosen the clamps, insert shims and retighten.



EDITOR: TOM CASPAR • ART DIRECTION: EVANGELINE EKBERG • PHOTOGRAPHY: MIKE KRIVIT

Tighter Joints

by Luke Hartle

2 No-Math Dado Setup



How many shims does it take to make a perfect-fitting dado? You could figure it out with calipers and math, but it's much easier to use a gauge block.

The gauge block is the exact thickness of a dado made without shims. For undersize 3/4-in. plywood, make a gauge block that's 11/16 in. thick. Confirm the gauge block's thickness by fitting it into an 11/16-in. dado.

Place the block next to a piece of the 3/4-in. plywood. Stack shims, one by one, on top of the block until the stack is even with the plywood. Add these shims to the dado set, plus one more that's the thickness of a sheet of paper (about .003 in.). The extra shim is the clearance needed for easy assembly.

Source International Tool Corp., (800) 338-3384, www.internationaltool.com Freud dado shim set, #FRESS100, $15.

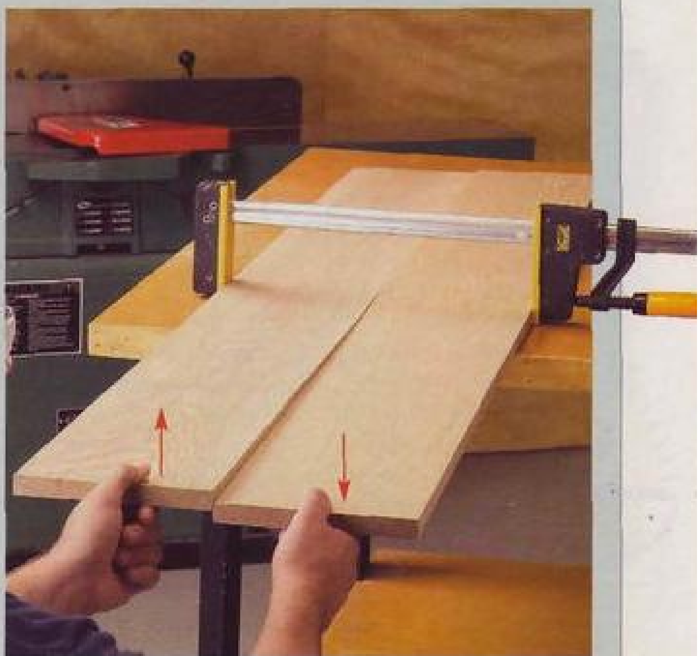
3 Test Long Joints

Hard-won experience has taught me to test edge joints before gluing boards together. The test is simple, but effective.

After jointing, I tighten a clamp across the middle of two neighboring boards. I walk around to both ends and wiggle the boards up and down past one another. If they rub together, great. The joint is tight and good to go.

If they don't rub against each other, I've got a problem. One edge—or both—isn't quite straight, which could result in the joint coming apart after it has been glued together. It may take years to fail, but it's not a risk worth taking. I rejoint both edges, making sure to put all my hand pressure down on the infeed table until halfway through the cut, then gradually switch to putting all the pressure on the outfeed table. That usually does the trick.

If using the right technique doesn't solve your problem, your jointer may need a tuneup. See www.americanwoodworker.com/jointertuneup for more information.





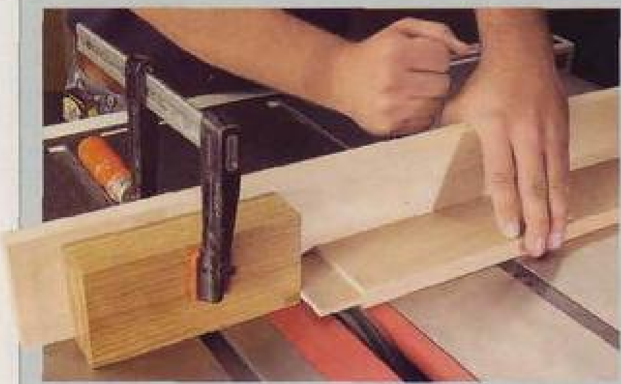


Here's an extreme example: Both these boards were jointed with the fence way out of square. Arranged as shown here, the bevels cancel each other, resulting in a tight joint and a flat top.

4 Flip Faces To Make a Flat Top

I have a tough time getting my jointer's fence perfectly square. I can't figure out a way to fix it, so I've adopted an old cabinetmaker's trick that cancels out the error.

Here's the deal: I alternate the faces that go against the jointer's fence (see photo, above). Each edge has a slight bevel from the out-of-square fence. Arranged without alternating the faces, the two edges form a V shape. An open joint would result on one side or the other if I were to force the top flat. By alternating the boards, I get a perfectly tight joint and a flat top, even though the edges aren't square. The only trick is to mark the boards beforehand so I place the correct sides against the fence.

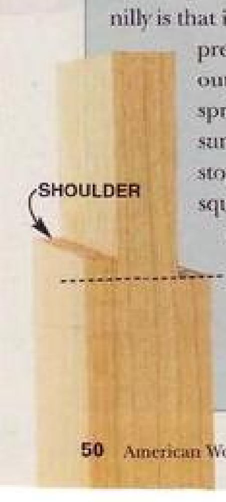


5 Perfect Tenon Shoulders

I thought I had tenon-making with a dado set figured out, but one day it all went haywire. One side of the joint wouldn't draw tight. The culprit? An inadequate stop-block setup.

I used to grab any old small cutoff for a stop block, holding it to the fence with a spring clamp. Wrong on both counts. The problem with a small stop block chosen willy-nilly is that it's not necessarily square. If the stop block isn't precisely square to the table, the shoulders come out at different heights. The problem with a spring clamp is that it doesn't deliver enough pressure. If the tenon pieces repeatedly bang into the stop block, they can easily knock the block out of square or out of position.

Now I use a big block, dedicated to the purpose, and a strong clamp.



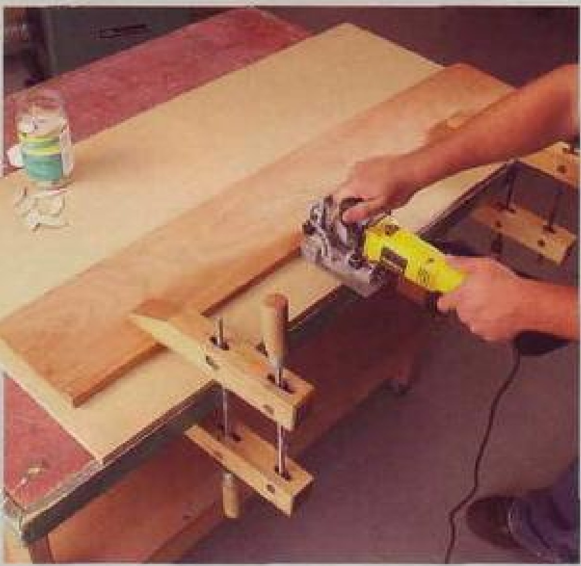
Uneven shoulders make an ugly joint. These shoulders are way off, but even a small error can create an unsightly gap.

6 Dovetail Gauge Block

It's no secret that setting up your router for a half-blind dovetail jig can be frustrating. Extend the router bit up too far and the joint will be too tight. Lower it down too far and it will be too loose.

I made a gauge block to record the perfect setting, once and for all. To make the block, I first used the standard trial-and-error method to make a tight-fitting dovetail joint. After I figured out how far the bit must extend, I rough-cut a notch in a block of wood using a bandsaw. I made the notch about 1/16 in. less deep than the bit's height. I turned the router over and used the dovetail bit to recut the notch's bottom. Now when I rout dovetails, I simply raise the bit until it touches the notch, lock the router down and start cutting.





7 Reference from the Base

Biscuits are great for aligning edge joints. I once used my plate joiner's fence to make these cuts, but after a few bad experiences, I've switched to referencing from the base. It's a little more work to set up, but the improved results are worth it.

Frankly, I have trouble with the fence method. If I don't hold the fence and the machine just so, my slots aren't consistent. Referencing from the base is less risky.

Here's the setup: Instead of my bench's uneven top, I use a big piece of MDF as a flat reference surface. I put each board face-side down and clamp it to the MDF with a pair of 12-in. hand screws. This creates a wide ledge for the plate joiner's base. I press down hard on the handle above the base to keep the base flat on the MDF.

8 Joint with Your Router

I learned this trick about jointing extra-long boards from a woodworker who only had a short-bed jointer. Jointing with a router isn't new, but most methods require an absolutely accurate straightedge to guide the router.

Actually, a perfect straightedge isn't necessary. All you need is a pretty good straightedge that's longer than the boards. A little bow in it doesn't matter. The trick is to rout both boards at the same time, so the edges mirror each other (see photo, below left). Bowed or not, they'll always fit tightly.

To set up, mill three blocks 11/16 in. thick. Use them as spacers to position and clamp the boards to a pair of sawhorses. Chuck a 3/4-in. bit in your router. Clamp the guide board so the bit takes an equal amount off both boards, about 1/32 in. Ride the router tightly against the guideboard, removing the spacers as needed.





This down-the-middle method joints both edges at the same time. The two boards will fit perfectly together, even if your guide board isn't perfectly straight.



9 Make More Room in the Mortise

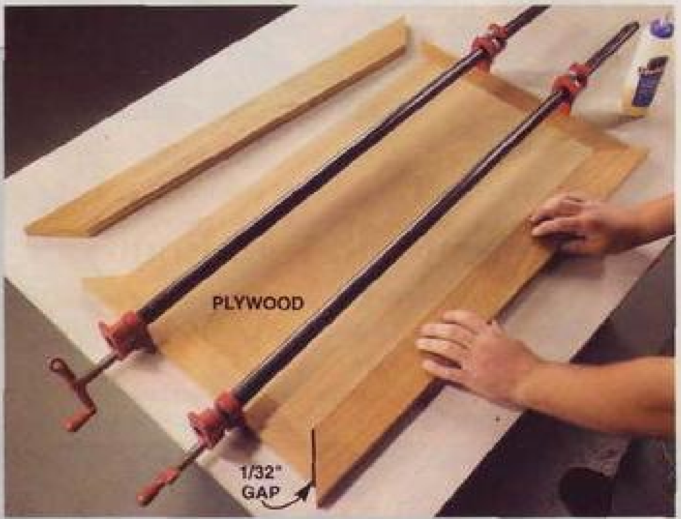
I well remember the day when I couldn't get a mortise-and-tenon joint to come together no matter how hard I tightened the clamp. I had ignored a fundamental rule: Always make mortises 1/16 to 1/8 in. deeper than the tenons.

There are two reasons for doing this. First, you don't have to obsess about making a perfectly smooth bottom in the mortise, which saves time. Second, space is needed for excess glue. This was the reason my joint didn't go home. The tenon had a tight fit on all four sides. Too tight, really. It had pushed all the glue to the bottom of the mortise. A deeper mortise would have given the glue space to pool and allowed the tenon to go home.

10 Make Tight Mitered Edging

My father used to tease, "I cut the darn board twice and it's still too short!" Of course he was kidding—or was he? When I make a mitered tabletop, I start with one or two pieces that are "too short" and a bit too wide. Jointing their inside edges effectively lengthens them until I get a perfect fit. This is much easier than trying to cut the boards to exact length.

The center of this top is a piece of plywood. (Solid wood won't work here because the center piece is unable to expand or contract with the seasons.) I often use biscuits or spline to align the edging with the plywood and to reinforce the corner joints.



1 Miter and glue the short pieces first. Rip the long pieces about 1/4 in. wider than the short pieces. Cut the long pieces a bit short, so they each have a 1/32-in. or so gap at one end.



2 Set your jointer to take a minimal cut, about 1/64 in. Joint the inside edges of the long boards. This lengthens the distance between the miters. In effect, the board becomes longer.



3 Check the board's fit after each jointer pass. When the miters come tight, mark the excess width, rip the boards and glue them on.

14 GREAT little TOOLS

by George Vondriska

Time-tested and woodworker-approved, here are some of our favorite workaday tools.

"What tools do I need for my shop?" This has to be one of the most common question in woodworking. The answer usually starts with the big power tools: tablesaw, jointer, router, planer. But what about those everyday tools we take for granted? You know, the kind that cause you to turn to a shopmate and say, "This is a great little tool."

I polled the *American Woodworker* editors and compiled a list of some of our favorite tools. All the picks are under $120, most of them way under. Here, in no particular order, is a short list of time-tested, woodworker-approved, great little tools.



Marking Gauge

Marking gauges are handy for all kinds of marking needs. Use one to scribe a line on a drawer side to locate mechanical slides or mark the depth of dovetails. I also use a marking gauge to lay out a board for resawing. After setting the gauge by eye to approximately the middle of the board, scribe a line with the gauge indexed off of one face and then scribe a second line with the gauge indexed off the opposite face. This almost always gives me a pair of lines that form a perfect track for my bandsaw blade to travel in as I resaw. If my eyes are really on the money, I get a single fat line to follow.



Source Lee Valley, (800) 871-8158, www.leevalley.com Veritas micro-adjust marking gauge, #05N35.10, $30.



Rabbet Plane

A rabbet plane has an iron that goes all the way to the edge of the body so you can plane up to a shoulder. It's the perfect choice to shave down a tenon for a snug fit. The Stanley 93 shown here is actually two planes in one. Loosen the knurled knob at the top and the lower unit drops out as a chisel plane. On a chisel plane, the blade sticks out the front, which makes it ideal for removing glue, cleaning up the corners in a hinge mortise or trimming plugs. This tool may not fall into your daily-use category, but when you need it, you can't beat it.

Source Highland Hardware, (800) 241-6748, www.highland woodworking.com Stanley 93 rabbet/chisel plane, #031805, $105.



CHISEL PLANE



Self-Centering Drill Bit

Self-centering drill bits are the best way to locate screws in hardware. The tapered nose of the bit nestles into the countersunk screw hole in the hardware. Just run the drill and push the bit into your work. The pilot hole is perfectly centered every time. Various sizes are available to match the size of the screws you're using.

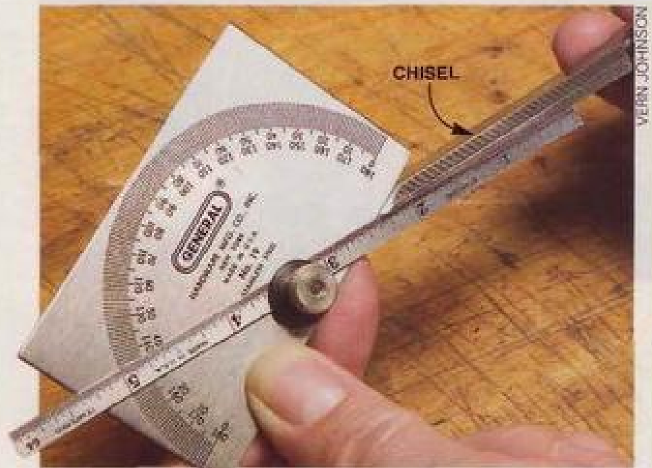
Source Woodcraft Supply, (800) 535-4482, www.woodcraft.com Set of three self-centering bits, 5/64 in., 7/64 in. and 9/64 in., #16I40, $29.



Pocket-Size Sprayer

Use a pocket-size sprayer when just a little dab will do ya. Got a touch-up to do? Fill the jar with finish, screw on the aerosol can, and let it fly. One can will spray about 16 oz. of liquid. This is also an easy way to make samples with different stains and finishes before you do the real thing. Sure beats cleaning out a whole spray-gun assembly for each sample.

Sources Woodcraft Supply, (800) 535-4482, www.woodcraft.com Preval spray gun, jar and power unit, #142198, $5.

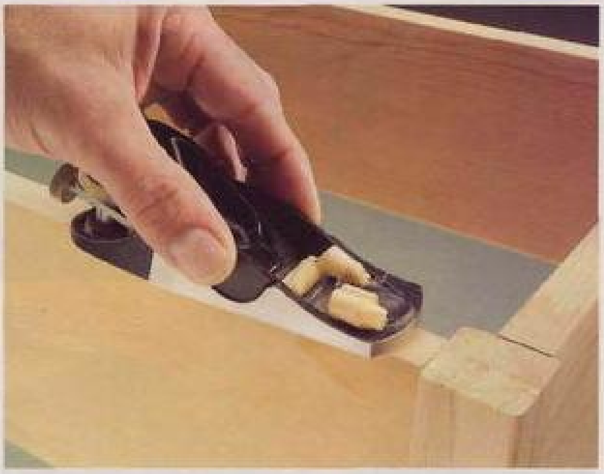


VERN JOHNSON

Sliding Protractor

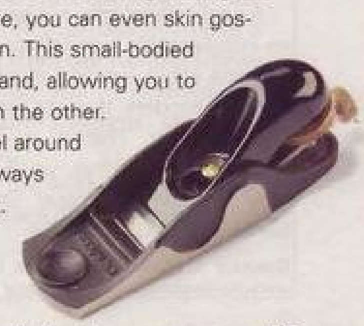
A sliding protractor can't be beat for measuring angles. I use it to check the bevels on my plane irons and chisels. The skinny arm not only pivots to indicate the angle but can be adjusted for length by loosening the knurled lock knob. I've used a sliding protractor to set the table on my drill press to drill angled holes for spindles in chair seats. The sliding arm can also be used to measure the depths of holes or mortises, even if they are cut at an angle.

Source MSC Industrial Supply, (800) 645-7270, www.mscdirect.com Sliding protractor, #06475198, $17.



Low-Angle Block Plane

A low-angle block plane is great for fine-tuning misaligned parts. With its low cutting angle, you can even skin gossamer shavings off of end grain. This small-bodied plane fits comfortably in one hand, allowing you to hold the part being planed with the other. It's even small enough to travel around in your apron pocket, so it's always right at hand when you need it.



Source Lee Valley, (800) 871-8158, www.leevalley.com Apron plane, #05P27.01, $75.

EDITOR: DAVE MUNKITTRICK • ART DIRECTION: EVANGELINE EKBERG • PHOTOGRAPHY: MIKE KRIVIT, UNLESS NOTED



Diamond Paddle

Diamond paddles can help you touch up an edge on a tired router bit. The paddles are embedded with industrial diamonds—abrasives that can sharpen carbide. The Hone and Stone paddle shown is small enough to fit under the flutes of a router bit and in your pocket. You can also use the paddles to freshen the edges on drill bits, hone scrapers, sharpen your pocket knife—you'll find many uses for this handy little tool.

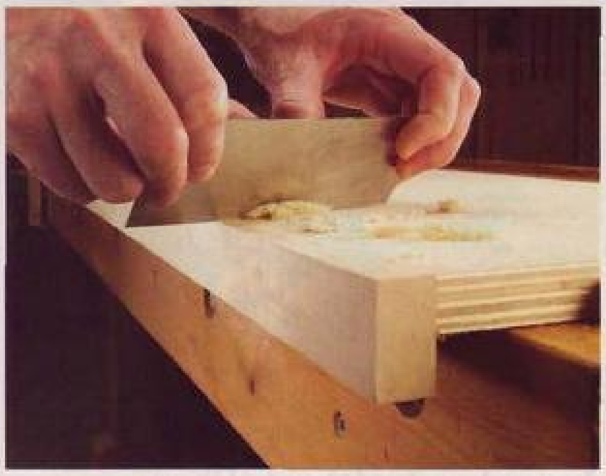
Source Eze-Lap, (800) 843-4815, www.eze-lap.com Hone and Stone diamond paddle, *fine* or *super-fine* grade, $5 ea.



Trim Router

A trim router allows routing with one hand. It makes quick work of rounding over cabinet parts. One-handed operation allows you to hold the piece in one hand and run the router with the other. The one-handed operation and small stature are also real boons if you need to manipulate the router in an awkward spot. A variety of trim routers are available; look for the "Tool Test: Trim Routers" story in the next issue.

Source Home centers and woodworking stores Approximately $110.



Card Scraper

A card scraper may not be much to look at, but it provides an indispensable way to remove tissue-paper-thin shavings. Worried about sanding through a veneer? Try a scraper. Tired of sanders that are noisy and raise lots of dust? Try a scraper. There's an art to sharpening it, but once you master that, you'll reach for *this* tool often (see "Foolproof Scraper Sharpening" AW #102, September 2003, page 63).

Source Lie-Nielsen Tool Works, (800) 327-2520, www.lie-nielsen.com Hand scraper set, #HSset, $15.





Sliding Bevel

A sliding bevel is one of the best ways to transfer angles from one surface to another. The blade slides and pivots within the head and can be locked with a turn of a lever or thumb screw. The sliding bevel works great for laying out dovetails. With the blade extended out both sides of the handle, you can flip-flop the bevel as you scribe each angled side of a pin or tail.

Source Home centers and woodworking stores $20 to $50, depending on size.



Paint Scraper

A 1-in. paint scraper may not be considered a traditional woodworking tool, but it can't be beat for scraping a glue joint. Grind or file a burr edge on the blade and this little paint scraper is capable of much more than simply scraping glue. Use it to shave hardwood edge banding or face frames flush with veneered panels. Its size makes it easy to control and the flared blade allows you to get right into corners.

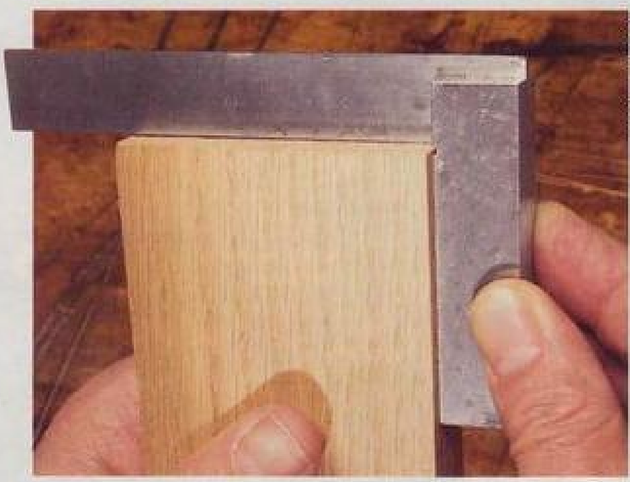
Source Home centers and hardware stores $5.



Small Lithium-Ion Drill

Palm-size lithium-ion drills are small but powerful little tools. Instead of grabbing a monster drill/driver, try one of the little ones, like the Skil ixo. It'll fit in the pocket of your apron, so it's there when you need it. The lithium-ion battery packs a lot of power in a smaller package than NiMh or NiCad batteries. This little drill can drive screws as long as 1-1/2 in., but it really shines on such tasks as mounting drawer guides and door hinges. Plus it fits in tight spaces where other drills can't go.

Source Home centers and hardware stores Skil ixo, $40.



VERN JOHNSON

Engineer's Square

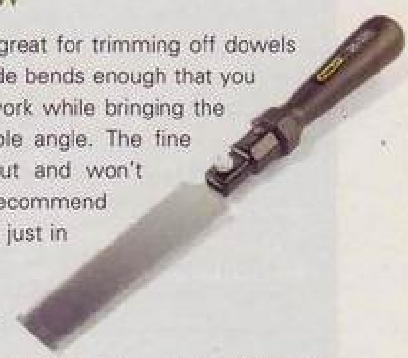
A small engineer's square is ideal for quickly checking project pieces for square. Use it to create layouts, check cuts fresh off your miter saw, set the 90-degree stop on your tablesaw or square the fence on your jointer to the table. Carry this little square around in your apron pocket and I guarantee you'll reach for it all the time. By checking as you build, you'll avoid aggravating mistakes that cause problems at assembly time.

Source Woodcraft Supply, (800) 535-4486, www.woodcraft.com Engineer's square, 2-in. blade, #141013, $10.



Flush-Cut Saw

A flush-cut pull saw is great for trimming off dowels you've left proud. The blade bends enough that you can keep it flat on your work while bringing the handle up to a comfortable angle. The fine teeth leave a smooth cut and won't score your work. Still, I recommend laying down a playing card just in case.



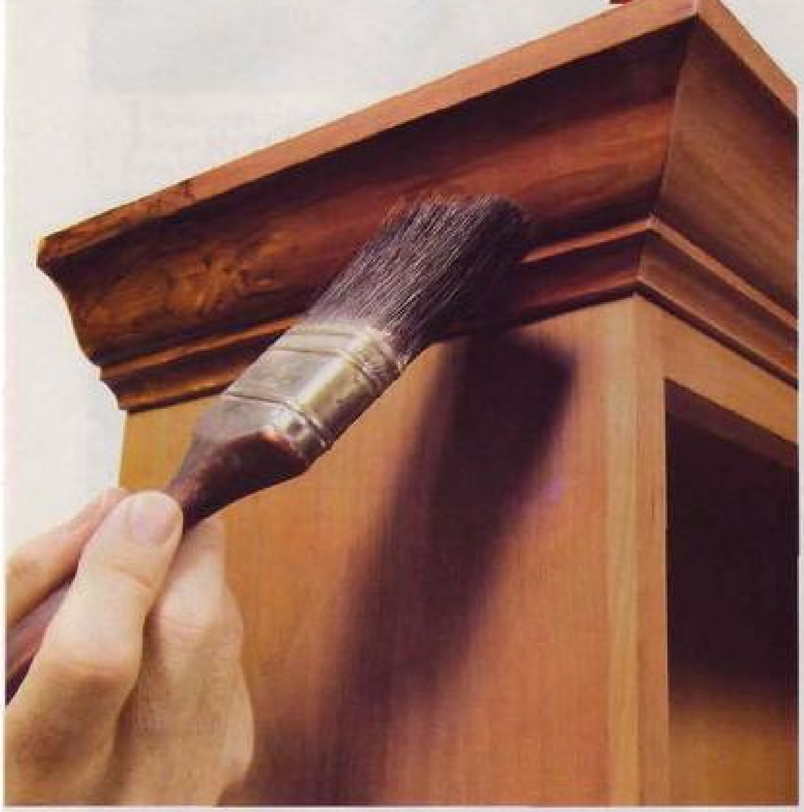
Source Home centers and hardware stores Stanley flush-cut saw, $18.

12 Finishing Tips

by Bob Flexner

Good finishers have lots of tricks up their sleeves. Here's a handful from Bob Flexner, one of the nation's foremost experts.

EDITOR: TOM CASPAR • ART DIRECTION: DAVID SIMPSON • PHOTOGRAPHY: BILL ZUEHLKE, UNLESS NOTED



1 Add Depth by Glazing

Glazing accentuates the three-dimensional look of moldings, carvings, turnings, and raised panels. A glaze is simply a thickened pigmented stain—thickening it reduces runs on vertical surfaces. Gel stain works well as a glazing material.

Glazing is always done over a sealed surface, meaning over at least one coat of finish. After the first (or second) coat of finish has thoroughly dried, wipe or brush on the glaze. Allow the solvent to evaporate so the glaze dulls. Then wipe off most of the glaze using a rag or brush, leaving some of the glaze in the recessed areas of your project.

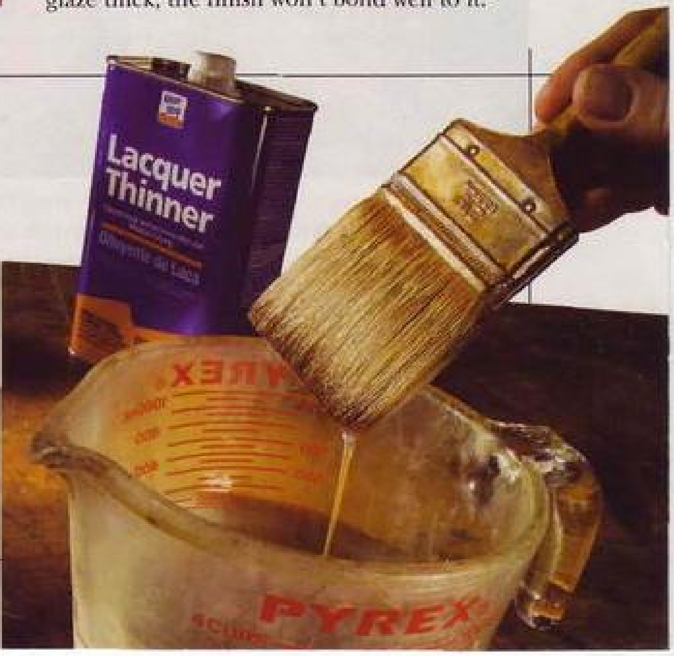
After the glaze has dried, apply at least one additional coat of finish. This prevents the glaze from being rubbed or scratched off. Never leave glaze thick; the finish won't bond well to it.

2 Clean Brushes with Lacquer Thinner

The standard procedure for cleaning a varnish brush is to rinse it a couple of times in mineral spirits, and then wash repeatedly in soap and water. I take an extra step: After the mineral spirits, I rinse my brush in lacquer thinner. Commercial brush cleaner works well, too.

Lacquer thinner or brush cleaner quickly removes most of the oily mineral spirits. This step makes washing with soap and water easier and quicker. You'll usually need only one or two soap-and-water washings to achieve a good lather, which indicates the bristles are clean.

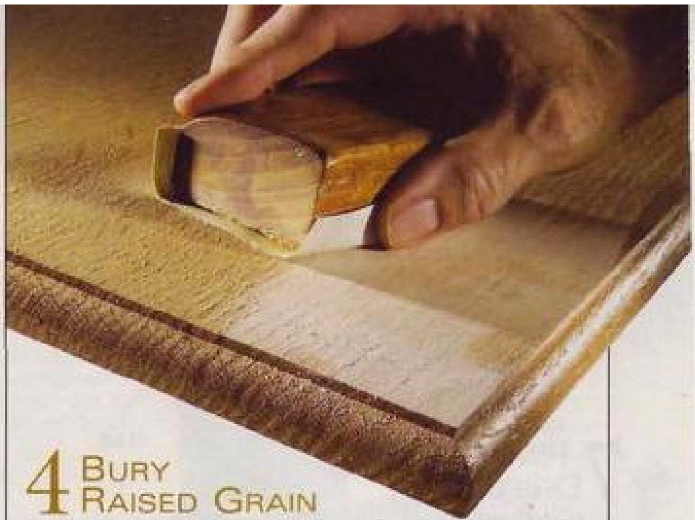
Remember to use adequate ventilation when you work with lacquer thinner or brush cleaner.





3 Keep Everything Clean

Reduce dust nibs by keeping your project and work area clean. If you are finishing in the same area where you've been sanding, allow time for the dust to settle and then vacuum the floor. Vacuum your project using the brush attachment. Use a lint-free cloth to remove any dust that remains in the wood's pores. Just before you begin brushing or spraying, wipe your hand over horizontal surfaces to be sure they are clean. You will feel dust you don't see. Your hand will also pick up small bits of dust that may have settled after you did the major cleaning.



4 Bury Raised Grain

Water-based stain and finish raise wood fibers, making the wood's surface feel rough. Many folks suggest prewetting bare wood with water and sanding the raised grain after the wood dries. This method is fairly effective, but there's an easier way.

Skip the prewetting and bury the raised grain in the finish. Burying simply means encasing the raised grain in a layer of finish. Apply the first coat of water-based finish and then sand it smooth, raised grain and all.

You can use the same approach with a water-based stain, which also raises the grain. The stained surface may become rough, but don't sand the stain. Apply one coat of finish and then sand. Be careful not to cut through the finish into the stain.



5 Ebonize with Black Dye

The easiest way to make any wood resemble ebony is with black dye. Unlike pigment, which is the colorant used in paint, dye has transparent properties. You can make wood as black as you want and still see the figure of the wood through the dye. I prefer to use walnut when ebonizing because its grain is similar to that of real ebony.

Dyes come in many forms. I prefer to use powdered water-soluble dyes because they offer more time to wipe off the excess. If the wood doesn't become black enough with one coat, make a more intense color or apply one or more extra coats. Allow the dye to dry between coats.

Source Tools for Working Wood, (800) 426-4613, www.toolsforworkingwood.com Lockwood water-based ebony black dye, 1 oz., #LW-WMIS.327, $6.75.



6 Reveal Flaws in Reflected Light

Something is bound to go wrong when you brush or spray. You may get runs, drips, spills, skips, orange peel—you know the list. The trick is to spot these problems in time to correct them. Reflected light is the answer.

As you finish, move your head so you can see the surface in a reflection of an overhead light, a window, a handheld light or a light on a stand. The reflection's shiny surface will show you the exact condition of the finish.



Bob Flexner is the author of the newly revised Understanding Wood Finishing.

Source Fox Chapel Publishing, (800) 457-9112, www.foxchapelpublishing.com *Understanding Wood Finishing*, 2nd ed., 2005, paperback, $19.95.



7 Find Dried Glue

Dried glue causes spotting when you apply a stain or finish. Most glue dries clear, though, so how can you tell where it is? Water or mineral spirits reveal all.

Before a final sanding, wet the entire surface with water or, if you have adequate ventilation, with mineral spirits. This will make the wood darker, but glue drips, spills and fingerprints will be easily identifiable because they'll appear as a light color. How does this work? Glue seals the wood's surface. Water or mineral spirits won't penetrate the glue spots, so those spots won't become as dark as the rest of the wood.

Water will soften dried glue, making it easier to remove with a card scraper or a chisel. You can also wash off glue by scrubbing with a rag and hot water. When you've removed the glue, sand with the highest grit of sandpaper you used on the rest of the project.



RICK MASTELLI

8 Spray Unseen Parts First

Spray the less seen and less touched parts of your project first. Spray the most important surfaces last. This way, overspray will land on parts where it really won't matter.

Overspray is the mist that bounces off an object or sometimes misses the object altogether. The mist floats in the air and eventually lands somewhere, often back on the project itself. Overspray makes surfaces it lands on feel rough.

Here's how to proceed on a table or chair. Spray a table's legs and rails before its top. Turn a chair upside down and spray the insides of the legs and insides and bottom sides of the stretchers. Stand the chair upright and spray the legs' outsides and the stretchers' tops and outsides. Finish by spraying the backside of the chair back, the arms and finally the front side of the back and the seat.



9 Sand More on End Grain

End grain can turn very dark when stained. More often than not, the problem is that the end grain is still somewhat rough from sawing. The same sanding procedure that you used on the rest of your project is often inadequate to prepare end grain for staining.

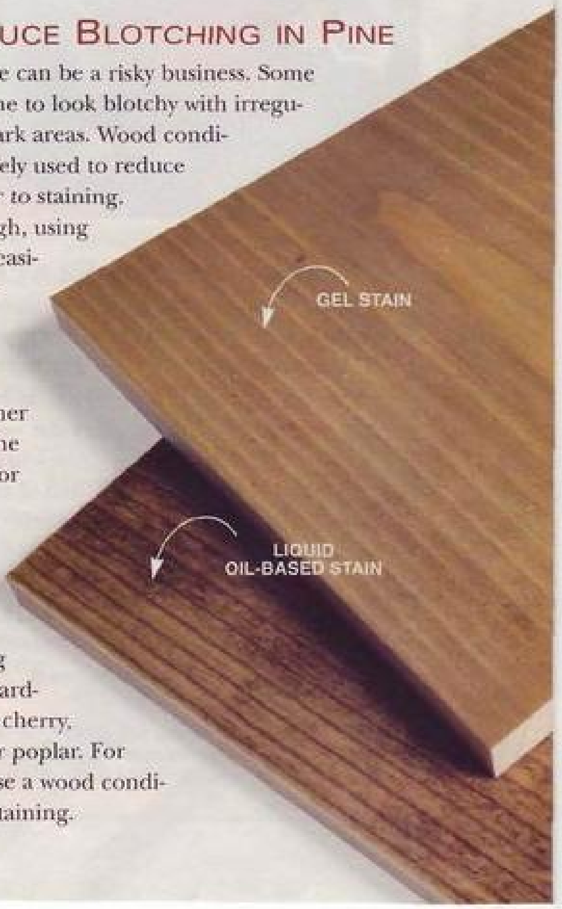
To remove saw marks, begin sanding end grain with a coarser paper than you are using on the side grain. An 80-grit sandpaper is usually coarse enough. When you have made the end grain smooth with this grit, work up through the grits just as you do with side grain, finishing with the same grit you used to finish-sand the side grain.

You can make sanding any end grain easier by sealing it with thinned glue or finish before you begin sanding. Thin a white or yellow glue with about three parts water. Thin any finish by about half with the appropriate solvent. Both methods stiffen the fibers, making them easier to cut off with the sandpaper.

10 Reduce Blotching in Pine

Staining pine can be a risky business. Some stains cause pine to look blotchy with irregular light and dark areas. Wood conditioners are widely used to reduce blotching prior to staining. For pine, though, using gel stain is far easier, more effective and more predictable than applying wood conditioner for achieving the intensity of color you desire.

In my experience, gel stain is not as effective at reducing blotching on hardwoods, such as cherry, birch, maple or poplar. For these woods, use a wood conditioner before staining.



11 Let Wood Conditioner Dry Thoroughly



Wood conditioners eliminate blotching much better when they're allowed to dry thoroughly. I believe the drying times recommended by manufacturers should be lengthened.

The directions for most solvent-based wood conditioners instruct you to stain within 2 hours of application. These conditioners are actually a varnish, which takes at least 6 to 8 hours to dry in a warm room. It's better to wait overnight before you apply stain.

Most cans of water-based wood conditioners say you can stain 30 minutes after applying the conditioner. I think you should wait at least 2 hours.



12 Thin the Finish for Better Leveling

Thinning a finish reduces brush marks and orange peel, which are two common problems when you're brushing or spraying. If the finish is thin enough, you can entirely eliminate these defects.

Use the appropriate thinner to thin the finish. Begin by thinning about 10 percent. Thin more, if needed, to achieve better leveling. For water-based finishes, it's best to use the manufacturer's "flow additive" to thin the finish. Adding a little water may help somewhat, but if you add too much, the finish will bead on the surface.

All finishes can be thinned. Sometimes instructions say not to thin a finish, but this is done to comply with EPA volatile organic compound (VOC) laws so less solvent evaporates into the atmosphere. No harm is done to the finish if it is thinned. Thinning does make a finish more likely to run on a vertical surface and to build at a slower rate, however. You may have to apply more coats than usual.

11 Drill Press Tips

Use your drill press for all it's worth with these great tricks.

If you tend to think of your drill press as a boring machine, you may not be using it to its full potential. These tips will help you find new ways to use your drill press and bring out its full potential as an indispensable woodworking tool.

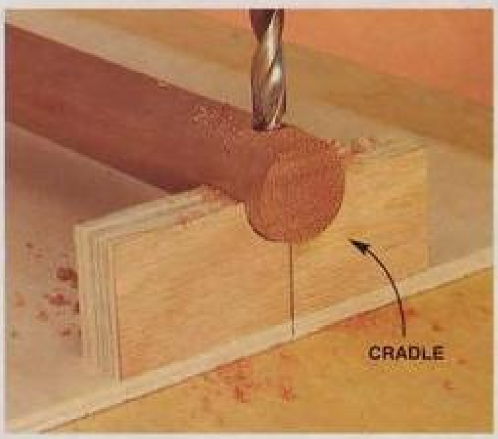
by George Vondriska



1 Prevent Clogged Bits

Keep drill flutes clear with a couple squirts of bit lubricant before you drill. This is especially helpful when you are drilling deep holes. And you'll really notice the difference when drilling into end grain, such as on the pen blanks shown here. Without a lubricant, the flutes jam quickly, which can cause the blank, not to mention your temper, to rupture.

Source Grizzly Industrial, (866) 523-4777, www.grizzly.com OptiCut XL bit lubricant, 4 oz., #H4870, $5.



2 Drill Without Blow-Out

Avoid blow-out on round stock by resting it in a half-round cradle instead of a V block. A cradle provides continuous support for the material so the bit won't blast through the back, leaving a ragged exit hole. To make the cradle, drill a hole the exact size of the round stock in a small piece of scrap and then cut it in half. Mount the two halves on a sheet of plywood to cradle the stock on each end.

EDITOR: DAVE MUNKITTRICK • ART DIRECTION AND PHOTOGRAPHY: VERN JOHNSON





3 Square the Table for Accuracy

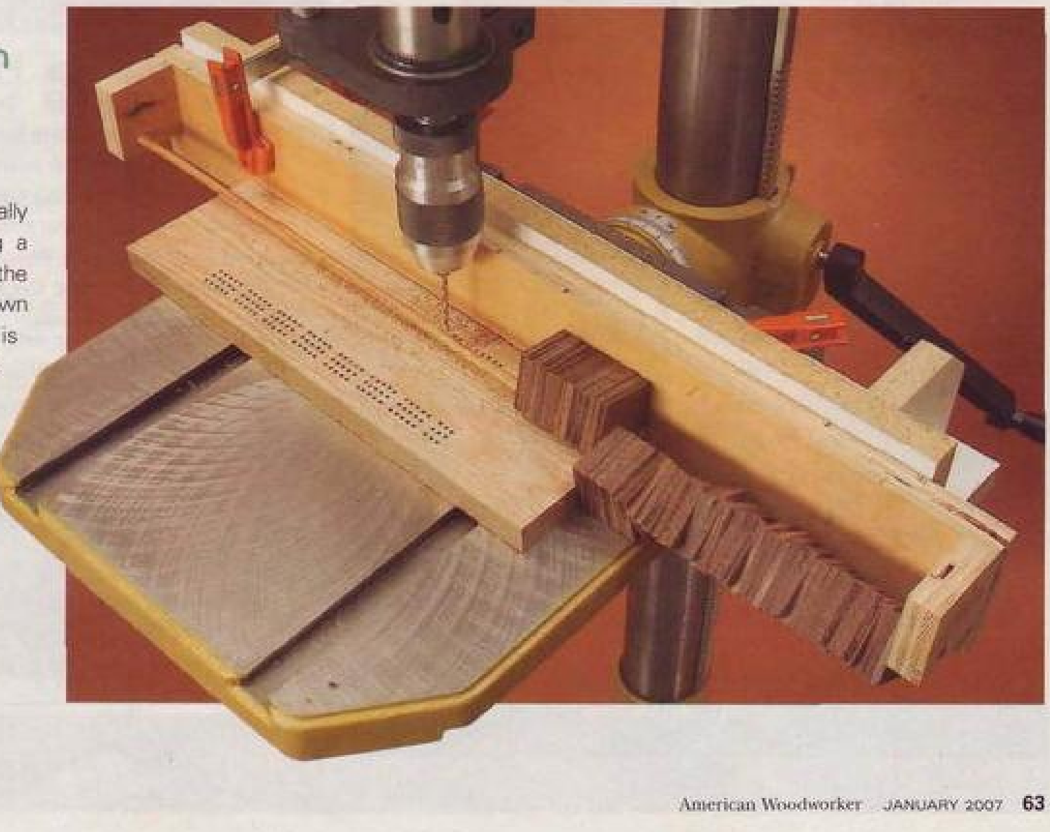
Square the table using this old machinists' trick. Bend a piece of 1/4-in. steel rod (available at home centers) into an S shape, as shown in the photo above. Mount it in the chuck and swing it by hand to each side of the table. Use a feeler gauge between the end of the rod and the tabletop to test the clearance at each end of the table. Adjust the table tilt until there's .003 in. or less difference between the two sides.

4 Find the Center

Perfectly center a hole by placing one face of your workpiece against a fence and dimpling the surface with the tip of the drill bit. Then rotate the workpiece end for end and dimple it again. If the two dimples don't line up, as shown here, the fence needs to be repositioned. To center the hole, move the fence by half the distance between the two dimples.

5 Drill a Million Evenly Spaced Holes

Drill a series of equally spaced holes using a set of flip stops. For the cribbage board shown here, each stop is made of 1/4-in. hardboard. Flip one stop for individual hole spacing, two for the large space between groups of holes.

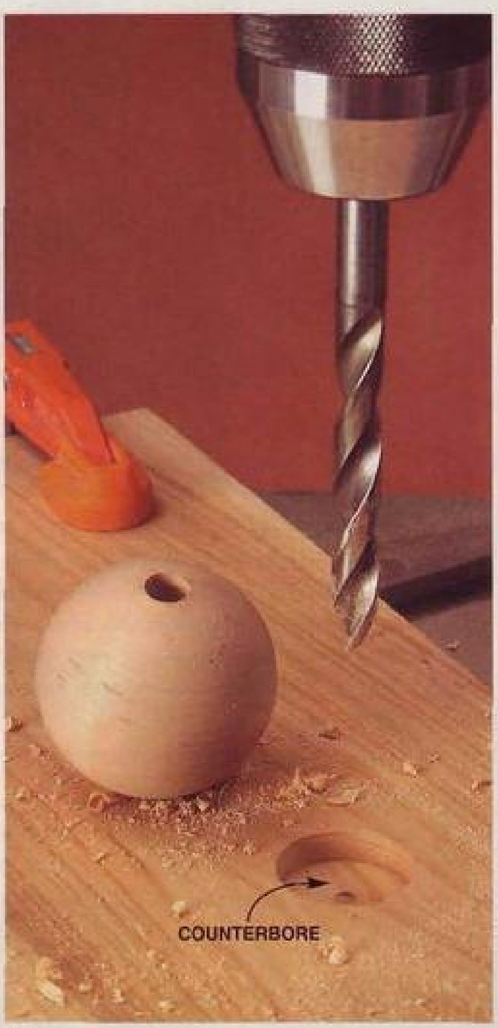




6 Sand Contours

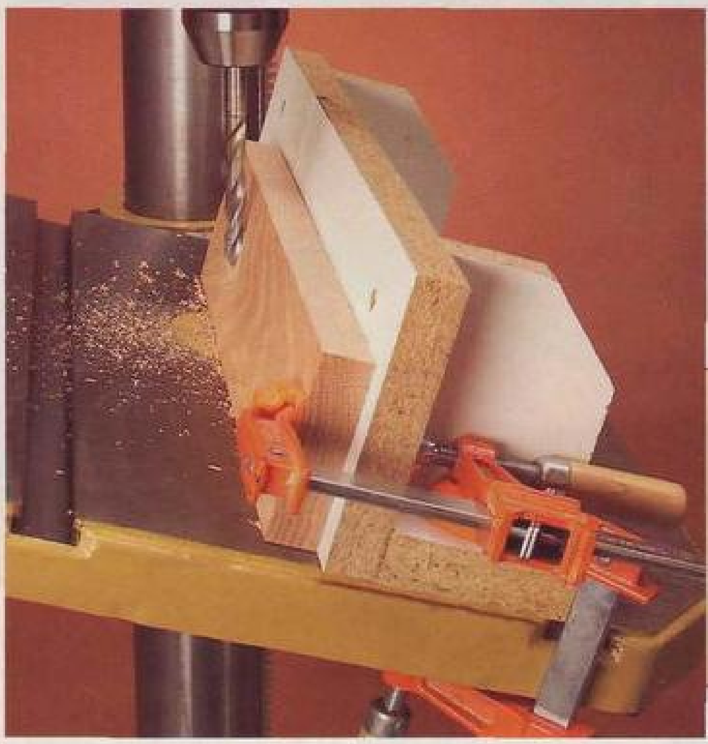
Shape parts on your drill press using an inflatable drum sander. You can adjust the stiffness of the drum by adding or removing air. Pumped up, it acts like a typical drum sander. Drain some air out and the sander will conform to the shape being pressed against it, gently rounding the corners, as shown in the photo above. The drum mounts to a metal base clamped to your table. The base minimizes lateral stress on your drill press spindle.

Source Woodworkers Supply, (800) 645-9292, www.woodworker.com
Pneumatic drum sander kit, including paper and base, #947-499, $70



7 Center a Hole in a Sphere

Drill a perfectly centered hole in a sphere by first counter-boring a hole in a scrap board clamped to your table. Drill the counterbore using a Forstner or spade bit that's roughly half the diameter of the sphere. Replace the first bit with a brad point, nest the sphere in the counterbore and drill away.



8 Drill Pocket Holes

Drill screw pocket holes using a 90-degree fence with the table angled to 15 degrees. A 3/8-in. brad-point or Forstner bit works best. This is a great way to put screw pockets into table aprons for fastening the top. This jig is not a substitute for a pocket-hole jig because the setup can't drill a screw pocket into the end of a long rail.



9 Enjoy Easy Depth Setup

Set the depth of cut using a drill bit. Mount the bit you need in the chuck and lower it until it touches your work. Lock the spindle in place. Then use a drill bit whose diameter matches the depth of the hole you need to set the stop collar on the drill press.

If you have a great drill press tip that isn't shown here, we want to hear about it. E-mail your tips to aweditor@readersdigest.com.





10 Sand Curves Without Dust

Sand curves with a drum sander and a shop-made sanding table. A hole in the tabletop, made 1/4 in. larger than the drum, allows the drum to project into the table. You can set the drum at various heights to use its entire surface. Drill a 2-1/4-in. hole in the side to hook up a dust-collector hose.

11 Use an Angled Ramp

Instead of tilting the drill press table, drill angled holes on a shop-made ramp. The ramp allows you to keep your table set square and gives you an instant, accurate setup for drilling angles. Cut the ends of the ramp using a miter saw or your tablesaw's miter gauge.

Goof-Proof C

by Tom Caspar

Cutting perfect miters on crown molding can be a real challenge. Make a mistake and a lot of expensive wood goes to waste. This method, which uses a shop-made miter box, puts the molding in its "natural" position, the way it will be placed on your project. It's easy to set up the saw and tweak the miter's angle for inside and outside joints. The saw's blade stays at 90 degrees to the table, so you don't have any complicated compound cuts to set up.



Start by building the miter box (see photo, below). Don't use screws; you don't want to accidentally cut into one. Use a combination square to figure out how wide the box's pieces must be to hold the molding in its natural, upright position. The bottom piece's width equals the molding's depth when it's installed. The side pieces' width equals the molding's height when it's installed plus the thickness of the bottom piece. Cut these pieces about 12 in. long and leave the ends square for now. Glue the box together; then miter the ends. Label each corner.

Cutting miters is very straightforward (see photos, right). For convenience, I always hold the box on the saw's left side. For the best results, screw the box to the miter saw's fence. For some cuts, the box's long side goes against the fence. For others, the short side goes against the fence. Using a high-tooth count blade will produce a very smooth cut, with no tearout on the molding's face.

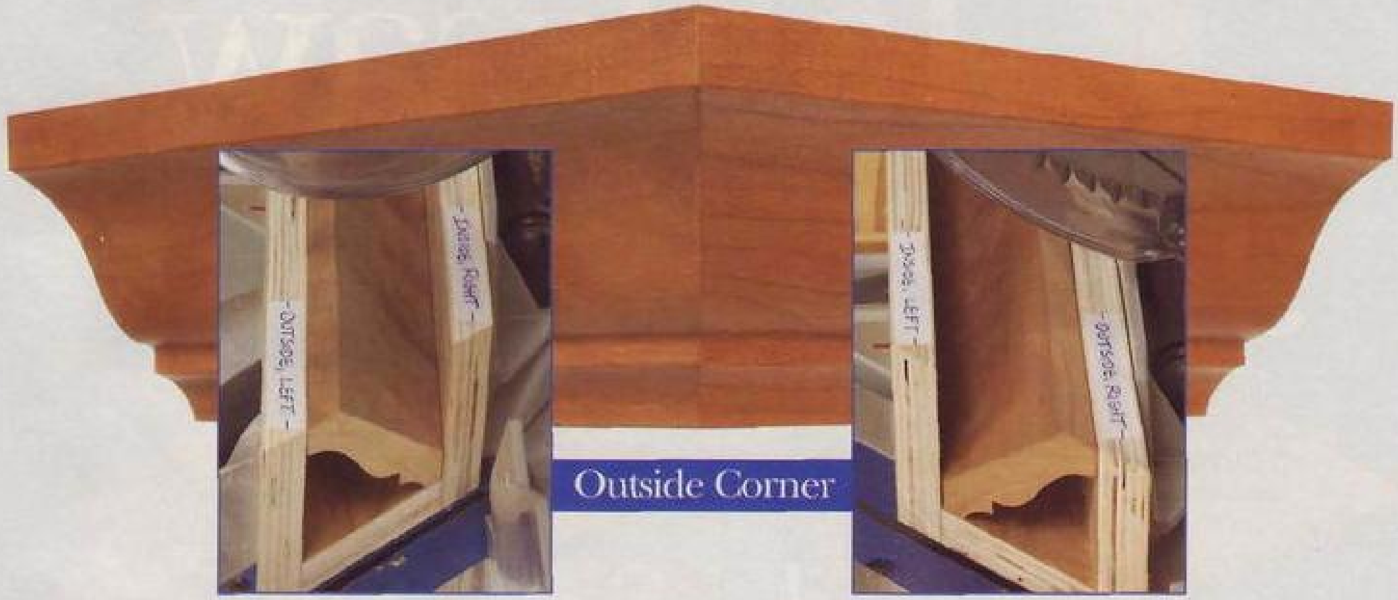
This method won't work on all saws and all crown moldings. Success depends on the molding's height and the saw's capacity. Many tall moldings can be cut this way using a 12-in. saw, but a 10-in. saw may not have adequate clearance.

ART DIRECTION: VERN JOHNSON • PHOTOGRAPHY: STAFF

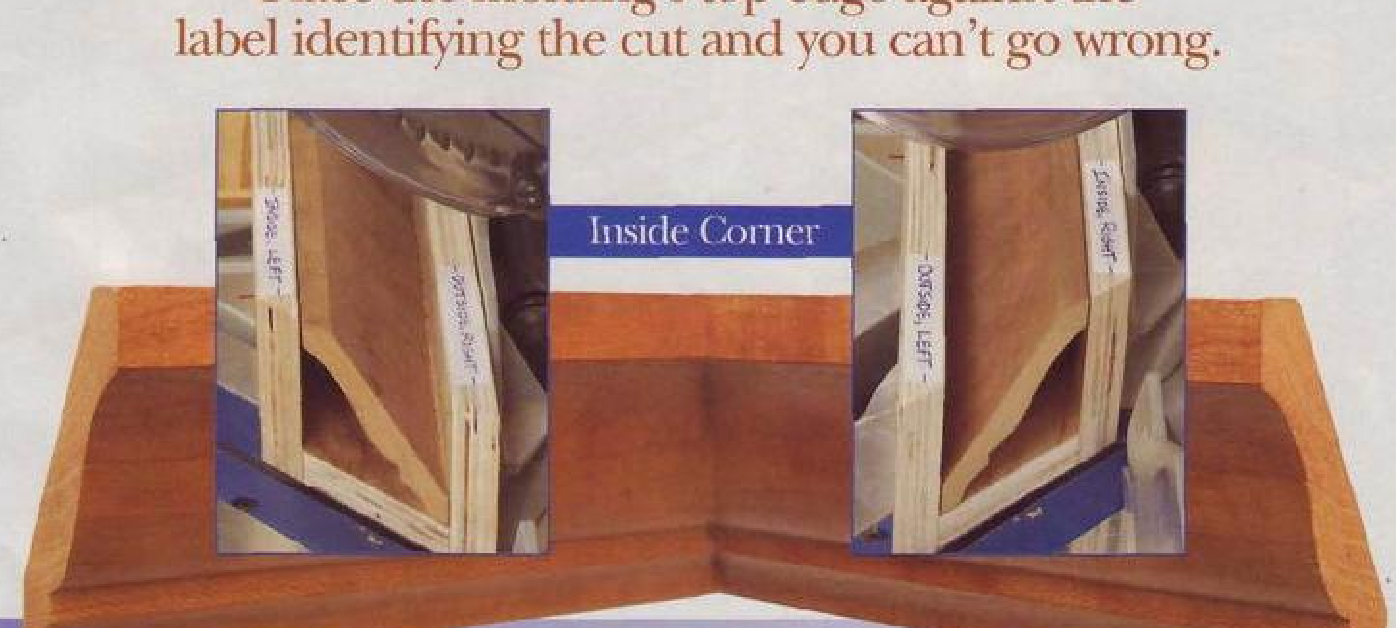


Build the miter box from three pieces of plywood. Label the corners to indicate how the crown molding is oriented for each miter cut.

rown Molding



Place the molding's top edge against the label identifying the cut and you can't go wrong.



4 Handy Tablesaw JIGS

Unlock your saw's full potential.

by Seth Keller

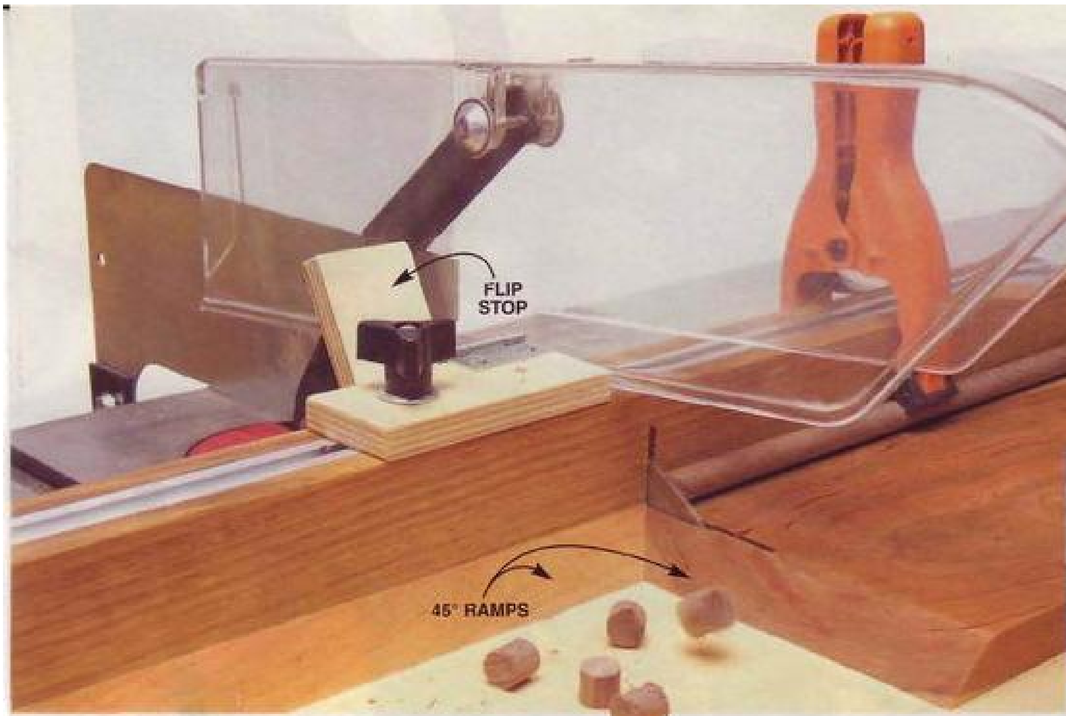


The tablesaw's power and precision put it at the center of everyone's shop. Despite this honored position, a tablesaw is mostly used for mundane ripping tasks. To make better use of my tablesaw, I use these four simple jigs in my shop. They take advantage of the tablesaw's speed and accuracy without tempting you to perform risky operations.

The first jig crosscuts small parts without putting your fingers in harm's way or sending little offcuts flying back into your face. The second jig allows you to repeatedly rip very thin stock without the risk of kickback. The third jig lets you safely crosscut panels for casework. And the fourth jig provides an easy, accurate way to cut tapered legs. All four jigs make use of the factory-milled miter slots found on contractor and cabinet saws. Once you have these jigs in your shop, you'll be surprised how often you reach for them and what a difference they make in your saw's capabilities.

Note: Except for the thin-rip jig, these jigs rely on an initial cut to define a zero-clearance edge. Because blade kerfs vary slightly, it's important to select and use the same blade each time you use the jig. So that you won't forget, note the blade used on the face of each jig.

EDITOR: DAVE MUNKITTRICK • ART DIRECTION: DAVE SIMPSON • PHOTOGRAPHY: RAMON MORENO, UNLESS NOTED • ILLUSTRATION: BRUCE KIEFFER



VERN JOHNSON



1 Small-Parts Jig

Cutting small parts usually means dodging little wooden bullets flying off your saw blade. This sled takes care of that problem. Push the sled slowly into the blade and your small part will slide safely down the ramp away from the spinning blade.

This jig is perfect for cutting plugs from dowel stock or other small decorative parts. Its maximum cutting capacity is 3/4-in.-thick stock. A simple sled stop prevents you from pushing the jig too far.

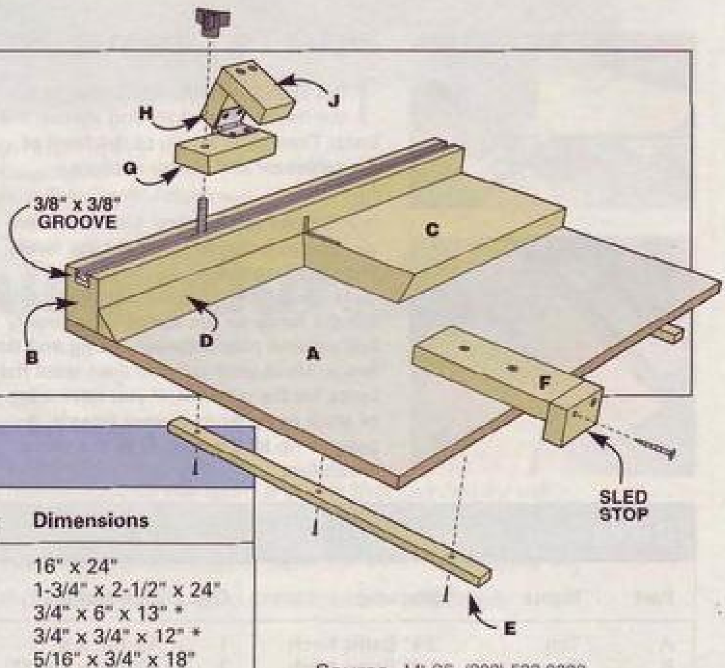
How To Use the Jig

An adjustable flip stop makes it easy to get accurate, repeatable cuts. Flip the stop down to position the workpiece and clamp. Then flip the stop up out of the way and make the cut. Repeat.

Figure A Small-Parts Jig

Build the Jig

With the blade lowered below the table, attach the sliders (E) on the sled base (A), and adjust for smooth action. Retract the sled and use a square to position and glue the fence (B) on the base. Then raise the blade to 2-1/4 in. and slowly push the sled partway through the spinning blade. Glue the ledge (C) to the sled, aligning the top of the 45-degree ramp with the kerf's left-hand side. Glue the ramp (D) in place as well. Screw the sled stop (F) onto the base to limit sled travel.



Cutting List

Part	Name	Material	Qty.	Dimensions
A	Sled base	1/2" Baltic birch	1	16" x 24"
B	Fence	Hardwood	1	1-3/4" x 2-1/2" x 24"
C	Ledge	Hardwood	1	3/4" x 6" x 13" *
D	Ramp	Hardwood	1	3/4" x 3/4" x 12" *
E	Miter slider	Hardwood	2	5/16" x 3/4" x 18"
F	Sled stop	Hardwood	1	3/4" x 2" x 10" **
G	Flip stop base	1/2" Baltic birch	1	1-3/4" x 4"
H	Hinge block	1/2" Baltic birch	1	1-3/4" x 1-3/4"
J	Sled stop	1/2" Baltic birch	1	1-3/4" x 2-5/8"

* Length may vary depending on saw.
** Cut off 2 in. and screw to end to make stop.

Source MLCS, (800) 533-9298, www.MLCSwoodworking.com
24-in. T-track kit, including featherboard (a bonus), two knobs and bolts, #9480, $21.



2 Thin-Rip Jig

This jig makes ripping lots of thin stock safe and easy. That's because the finish piece is the offcut, rather than the piece pushed between the fence and the blade. The jig is used to set the fence for each cut so the offcut is always the same width.

While it is possible to rip thin stock using only the tablesaw's fence, you have to remove the guard and squeeze your stock and push stick through the dangerously narrow gap between the blade and your fence. Can you say "kickback"? Even if you successfully navigate this dangerous cut, you inevitably end up with burn marks and uneven cuts that have to be sanded out.

This jig flips the equation, making the narrow offcut the finished product. The jig is simple to set up and can be adjusted to cut strips of various widths. You can rip miles of cabinet trim without breaking a sweat. Best of all, there is simply no chance for kickback and the guard can stay on the saw where it belongs.





How To Use the Jig

1 Set the rip width. Adjust the jig to the desired rip width and tighten the knob. Then slide the jig to the front of the tablesaw and clamp in place.

2 Set the saw's fence. Use the board you're going to rip to set the fence. Hold the board against the fence and slide it until it makes contact with the jig. Set the fence so the board slides easily but without play between the jig and the fence. Make your cut and then reset the fence for the next cut. If you have a lot of stock to rip from several boards, it pays to rip all the boards to the same width first.

Cutting List

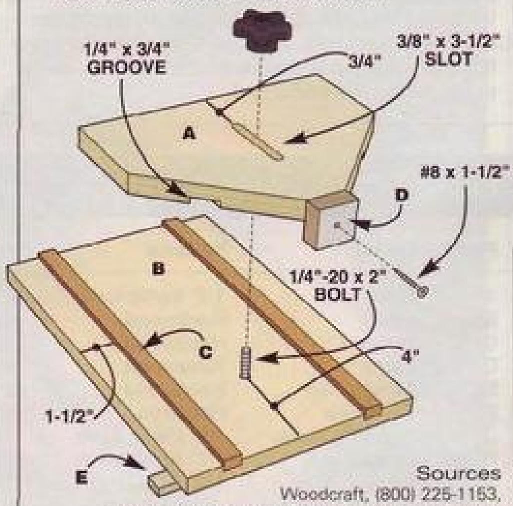
Part	Name	Material	Qty.	Dimensions
A	Top	3/4" Baltic birch	1	10-1/2" x 8" *
B	Base	3/4" Baltic birch	1	10-1/2" x 24" **
C	Rail	Hardwood	2	1/2" x 3/4" x 24"
D	Stop	3/4" melamine	1	1-1/4" x 1-1/4"
E	Miter slider	Hardwood	1	5/16" x 3/4" x 12"

* Groove A and B as the same piece and cut to make two parts.
** Must be long enough to reach the edge of your tablesaw.

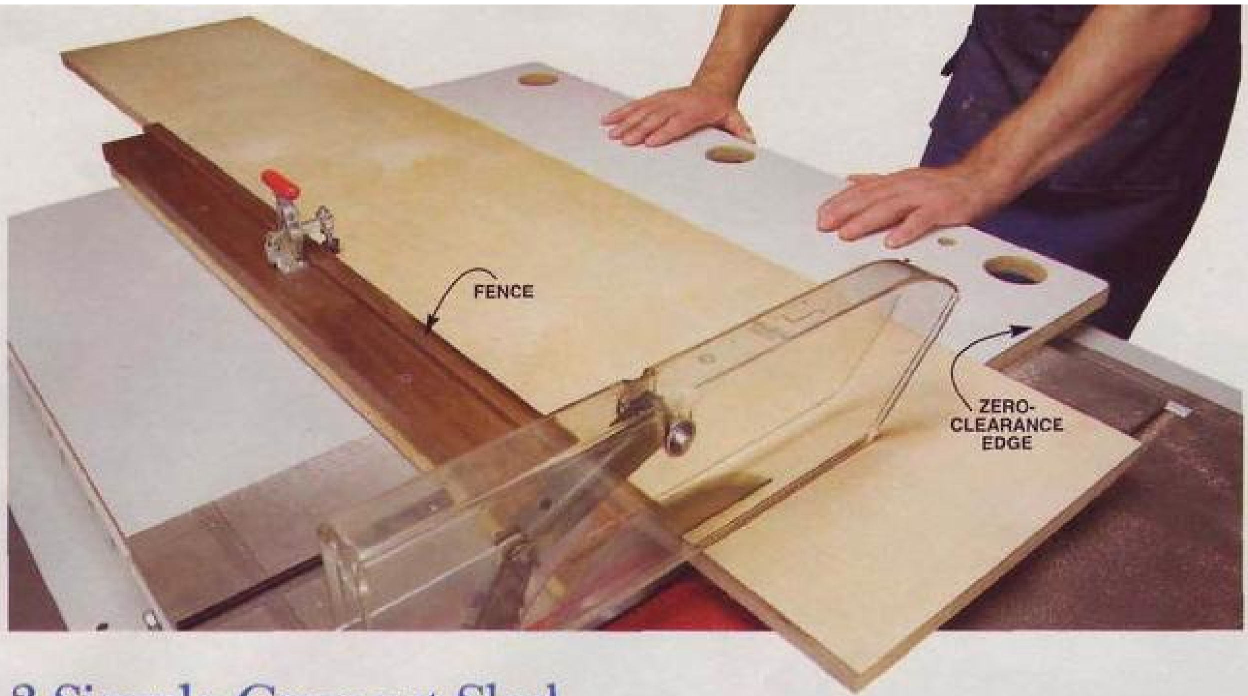
Figure A Thin-Rip Jig

Build the Jig

Run the grooves in a single board long enough to cut both the top (A) and base (B). Cut the top and base parts to length. Trim the corners off the top. Attach the miter slider to the base. Glue the rails (C) into the base. Seat the fence on top of the sled and install the T-nut and five-star knob.



Sources
Woodcraft, (800) 225-1153, www.woodcraft.com, Five-star knob, #27RB, $2.
• Hardware store 1/4"-20 x 2" bolt, $0.30 ea.



3 Simple Crosscut Sled

Unlike typical crosscut sleds, this jig sits entirely to the blade's right side with a single fence at its leading edge. This configuration has many advantages:

1. It allows you to keep the saw guard in place.
2. The zero-clearance edge reduces tearout.
3. The width of your stock is not limited by the distance between the front and back fence on a typical crosscut sled.
4. The jig is lightweight, so you'll grab for it often.
5. A clamp on the fence holds your plywood in place while you cut.
6. With only five parts, it's a cinch to build.

To use, just position your sheet stock so your cut mark lines up with the zero-clearance edge on the sled and clamp. The sled bears the weight of your workpiece to make a clean, smooth cut. Holes cut in the sled's trailing edge are handholds for pulling the sled back after a cut.

The Incra Miter Slide

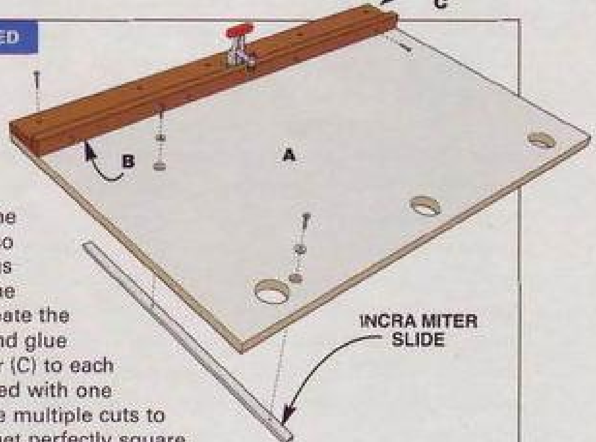
The Incra Miter Slide is perfect for this crosscutting jig. The slide attaches by countersunk bolts to the underside of the sled. Once it is attached, you can adjust the slide's fit by turning the bolts through a hole in the top of the sled. A well-adjusted slide will glide smoothly without play, increasing the performance and accuracy of the sled.

Source Woodcraft, (800) 225-1153, www.woodcraft.com Incra Miter Sliders, 18 in., #14V59, $15; 24 in., #129795, $20.

Figure A Simple Crosscut Sled

Build the Jig

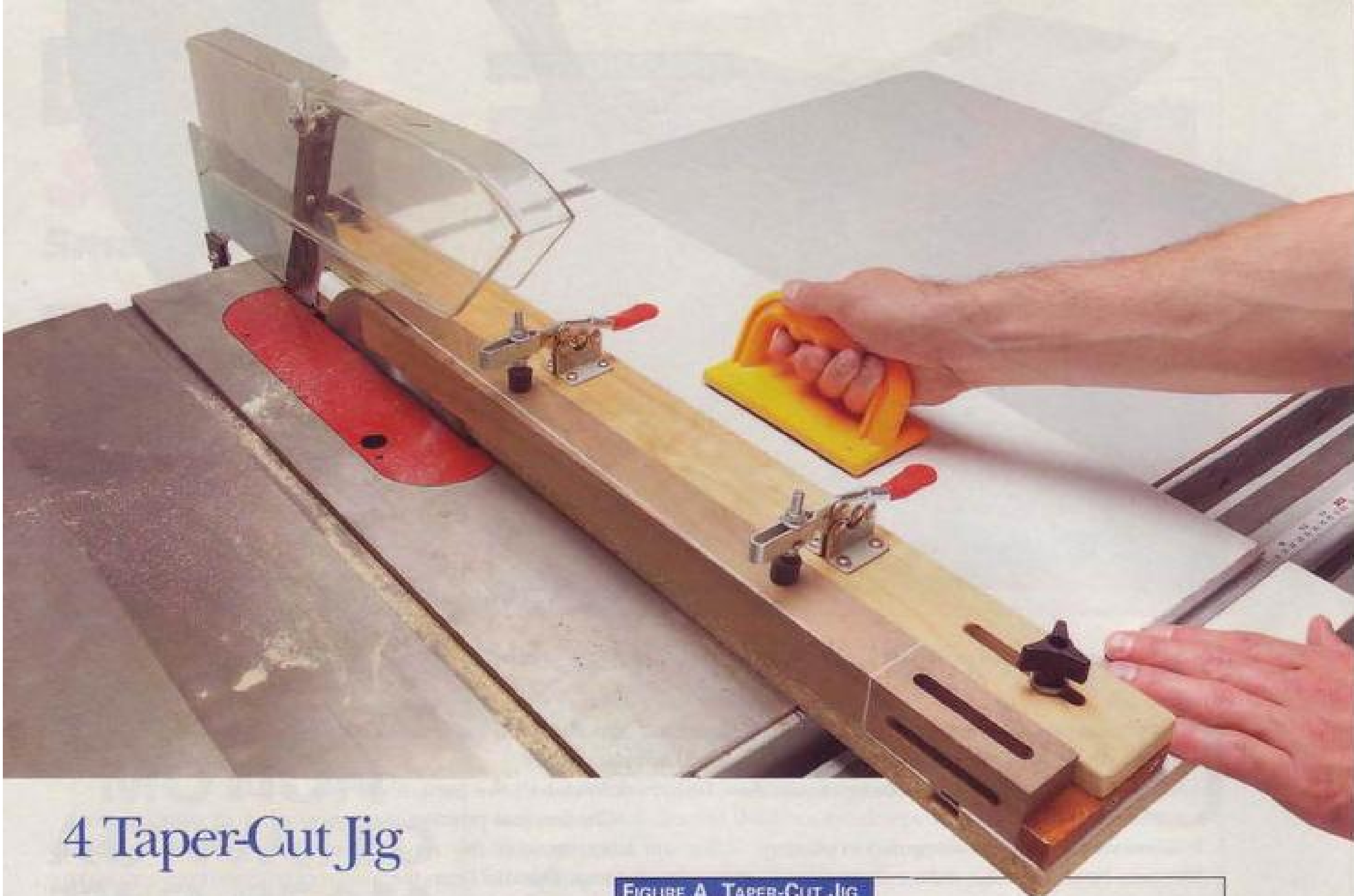
I used a commercial miter slide for this jig because a smooth, stable sliding action is a must for accurate crosscuts. Install and adjust the Incra Miter Slide on the sled so the base (A) slightly overhangs your saw's blade slot. Raise the blade and trim the base to create the zero-clearance edge. Screw and glue the fence (B) and fence backer (C) to each other. Affix the fence to the sled with one screw nearest the blade. Make multiple cuts to fine-tune the fence until you get perfectly square cuts. Fix the fence permanently with screws. Cut three holes along the trailing edge to provide handholds for pulling the jig back after a cut.



Source Woodcraft, (800) 225-1153, www.woodcraft.com Toggle clamps, #143937, $12.

Cutting List

Part	Name	Material	Qty.	Dimensions
A	Sled base	3/4" melamine	1	24" x 36"
B	Fence	Hardwood	1	3/4" x 1-1/2" x 36"
C	Fence backer	Hardwood	1	3/4" x 2" x 36"



4 Taper-Cut Jig

Plenty of commercial tapering jigs are available, but none makes the job as simple or as safe as mine does. That's because my tapering jig uses the miter slot rather than the saw fence as a guide. This allows me to put a big base on the jig and keep my hands well clear of the blade.

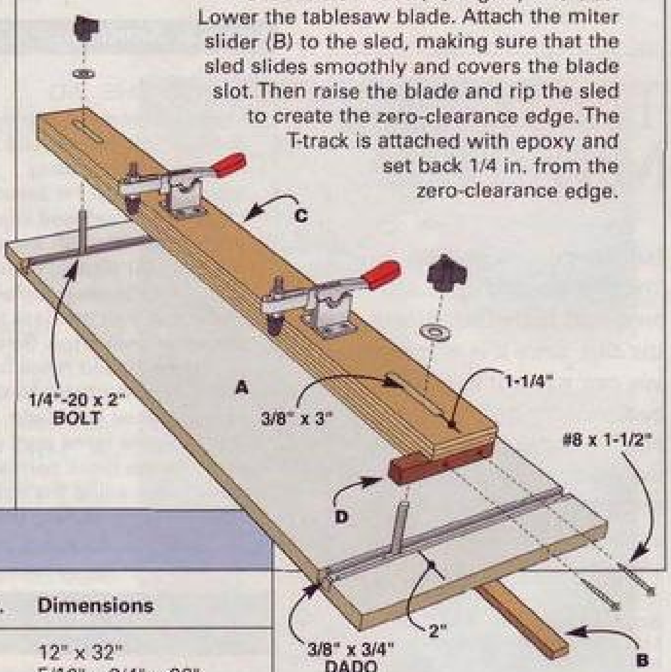
Toggle clamps, not fingers, hold the stock firmly in place. An adjustable fence allows me to align the taper mark on my stock with the jig's zero-clearance edge for quick, easy setups.

Set the blade height about 1/8 in. above your workpiece. Use a push block to safely power the jig through the cut. The jig can cut tapers on 2-1/4-in.-thick stock. For thicker stock, make the initial cut, flip the stock end for end after the first cut, align the saw kerf with the zero-clearance edge, set the fence and finish the cut.

FIGURE A TAPER-CUT JIG

BUILD THE JIG

Cut the sled base (A) slightly oversize. Lower the tablesaw blade. Attach the miter slider (B) to the sled, making sure that the sled slides smoothly and covers the blade slot. Then raise the blade and rip the sled to create the zero-clearance edge. The T-track is attached with epoxy and set back 1/4 in. from the zero-clearance edge.



CUTTING LIST

Part	Name	Material	Qty.	Dimensions
A	Sled base	3/4" melamine	1	12" x 32"
B	Miter slider	Hardwood	1	5/16" x 3/4" x 36"
C	Fence	3/4" birch plywood	2	3/4" x 2-3/8" x 32" *
D	Replaceable stop	Hardwood	1	3/4" x 3/4" x 4"

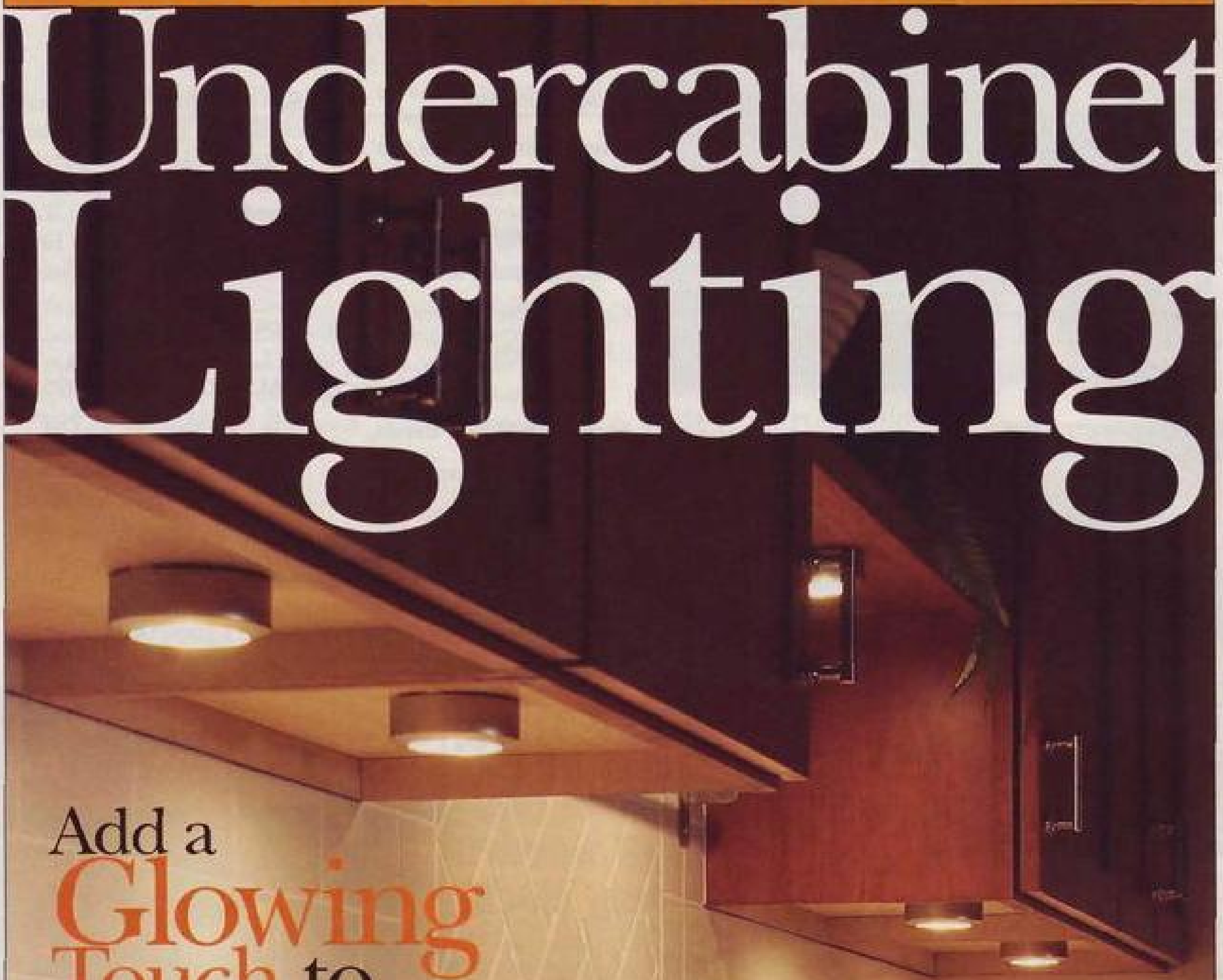
* Cut oversize and face-glue two together to make fence, leaving 3/4 in. overhang for replacable stop.

Sources MLCS, (800) 533-9298, www.MLCSwoodworking.com
24-in. T-track kit, including featherboard, two knobs and bolts, #9480, $21.
Toggle clamps, #9058, $8. • Home centers or hardware stores Bolts and washers.

MODERN CABINETMAKER

by Brad Holden

Undercabinet Lighting



Add a Glowing Touch to Beautiful Cabinets

Want a quick way to improve upper kitchen cabinets? Install lights under them. Undercabinet lights eliminate shadows in work areas and improve the room's atmosphere. Some may be controlled with a dimmer switch to make your kitchen even more inviting. You can design cabinets to accommodate these lights and wiring or add them after the cabinets have been built and installed.

Four major types of undercabinet light fixtures are available: fluorescent, halogen, xenon and light-emitting diode (LED). Some can be dimmed; others cannot. Some emit warm, golden light; others shine a cool light that's closer to daylight. Learning about the features, pros and cons of each type will help you select the best options for your kitchen cabinets.

EDITOR: TOM CASPAR • ART DIRECTION: MARK JACOBSON AND VERN JOHNSON • PHOTOGRAPHY: STAFF

FEATURES

All four types of undercabinet lighting are available in easy-to-install fixtures (see Sources, page 84). Often, individual lights plug into power blocks, which connect to a transformer (see photo, top). The transformer plugs into a wall socket. On larger units, the transformer is housed in the fixture. Fixtures can be purchased as individual components or complete kits. Kits include everything you need: transformers, connectors, plugs and power blocks.

Some fixtures can be hardwired if you want to hide wires inside a wall or use a switch mounted in a wall. In this case, you wire the transformer into a junction box, then plug the fixtures into the transformer. (For information about hardwiring, go to www.americanwoodworker.com/installingundercabinetlighting.)

DIMMING CAPABILITY

Only halogen and xenon lights can be dimmed, a feature I really like. I turn my kitchen lights all the way up when I'm working and dim them for a more relaxing ambience when it's time to eat. There are three switching options: an add-on touch-pad dimmer, a hardwired wall switch or a fixture with a high and low setting. Xenon lights must be hardwired if you wish to dim them. Halogen lights can be hardwired or installed with a touch-pad dimmer. The dimmer can sit on the counter or mount under the cabinet near the lights. It's as easy as plugging the transformer into the dimmer and plugging the dimmer into a wall outlet.

WARM, COOL OR NEUTRAL LIGHT

Color temperature, given in degrees Kelvin (K), indicates a light's color appearance (see chart, below). Warm lights below 3,500 K project a yellow or orange appearance (see photo, right). Cool lights above 3,500 K emit a blue or green cast. Fluorescent and LED lights run the spectrum from warm to cool. Halogen and xenon lights emit a warm cast. Most people prefer lighting that appears warm.

SPOT OR STRIP LIGHTS

All four types of lights are available in small spot or puck lights, or long strip fixtures (see "Undercabinet Lighting Types," page 84). Puck lights are more versatile. They can fit into small spaces or can be linked together to cover a large area. Use one puck light every 12 to 18 in.

ENERGY EFFICIENCY

Fluorescent and LED lights are about five times more efficient than halogen and xenon lights.



Undercabinet lighting can be easy to install. Many fixtures plug directly into multiple-outlet power blocks, which in turn plug into a transformer. Plug the transformer into an existing wall socket.



Fluorescent and LED undercabinet lights cast warm-colored light (left) or cool-colored light (right), depending on the bulbs you select. Halogen and xenon fixtures cast a warm light.

Type of Light	Light Output (lumens per watt)	Average bulb life	Color Temperature (degrees Kelvin)	Dimmable
Incandescent (100 watt)	13 lw	1,000 hours	2,750 K	Yes
Fluorescent (48" 28 watt)	**82 lw**	**10,000 to 20,000 hrs.**	**3,000 to 6,000 K**	**No**
Halogen	**19 lw**	**2,000 to 4,000 hrs.**	**3,000 K**	**Yes**
Xenon	**15 lw**	**8,000 to 10,000 hrs.**	**2,700 K**	**Yes**
LED	**80 lw**	**20,000 to 50,000 hrs.**	**3,200 to 5,500 K**	**No**
Midday sunlight	NA	NA	5,500 K	NA
Candlelight	NA	NA	1,500 K	NA

Undercabinet Lighting Types



Fluorescent

Fluorescent lights have come a long way in recent years. New fixtures don't hum or flicker when they're turned on. Fluorescent lightbulbs are available in warm, cool and daylight color casts. They're efficient and don't produce much heat, making them comfortable to work near. In addition, they won't melt the butter on your counter! A typical fluorescent undercabinet lightbulb will last 10,000 to 20,000 hours. Along with the familiar strip form, fluorescent lights are also available as compact puck lights. Most fluorescent lights are not dimmable.



Halogen

Halogen lights produce crisp, warm white light very similar to what standard incandescent bulbs emit. In fact, halogens are incandescent bulbs with halogen gas inside to prolong the filament's life. Halogens are dimmable, compact and available in pucks or strips. The main drawbacks are that they're not as efficient as LEDs and fluorescents, and they generate a lot of heat. A halogen bulb lasts as long as 4,000 hours. That's the shortest bulb life-span of the four types of fixtures, but much better than a standard incandescent bulb, which lasts from 750 to 2,000 hours.



Xenon

Xenon lights are incandescent bulbs that contain xenon gas to extend the filament's life. A xenon bulb produces light similar to that of a standard incandescent, only slightly less yellow in color. And it will last 8,000 to 10,000 hours. Most xenon lights may be dimmed if they're hardwired to a standard dimmer switch. Xenon bulbs are available with two different bases. The more standard xenon bulb has a wedge-shaped base; a bi-pin base is available as a replacement bulb for some halogen fixtures. Xenon lights last longer and generate about 15 percent less heat than halogen lights do.





LED

LED lights are available in fixtures that produce either warm or cool white light. They're extremely compact and consume miniscule amounts of energy—a single fixture with three bulbs uses only 3 watts. They generate very little heat and last as long as 50,000 hours. LED lights have two drawbacks. First, they're not dimmable. Second, they're expensive: Expect to pay $100 or more for a high-quality undercabinet fixture.

Sources Woodworkers Hardware, (800) 383-0130, www.woodworkershardware.com • Pegasus Associates, (800) 392-4818, www.pegasusassociates.com



Oops! special



When *American Woodworker's* Oops! department started, I volunteered to take charge, because I figured I'd made every woodworking mistake in the book. Boy, was I wrong. Whether cutting meat with a bandsaw (and wondering later about the putrid smell permeating the shop) or inadvertently gluing a huge butcherblock top-side down to the garage floor, woodworkers are very creative when it comes to buffoonery.

One guy managed to get his clothing so tangled in his belt sander that he had to strip and make repairs au naturel. Another hooked his ear on one of the dangling fishhooks he was using to hang picture frames for finishing. A third painstakingly built a spiral staircase in his shop, only to discover at the job site that the stairs spiraled in the wrong direction.

Yes, it's crowded here in the Oops! mailroom, but that just adds to the fun. So keep sending us your tales from the wacky side of woodworking. The more tales we receive, the more we get to share.

Tim "OOPS!" Johnson



Bad Hair Day

I planned to spray-finish the Adirondack chairs I'd made using polyurethane formulated for exterior use. I decided to do the job outside, so I wouldn't have to cover everything in my shop to protect from overspray.

I started with each chair upside down, so I could spray the bottom. Then I righted the chair and sprayed the sides, the seat, the arms, the back and the front. It was a sunny day and warm, so by the time I finished spraying the second chair, the finish on the first chair was dry enough for a second coat. With two coats of finish, both chairs looked great.

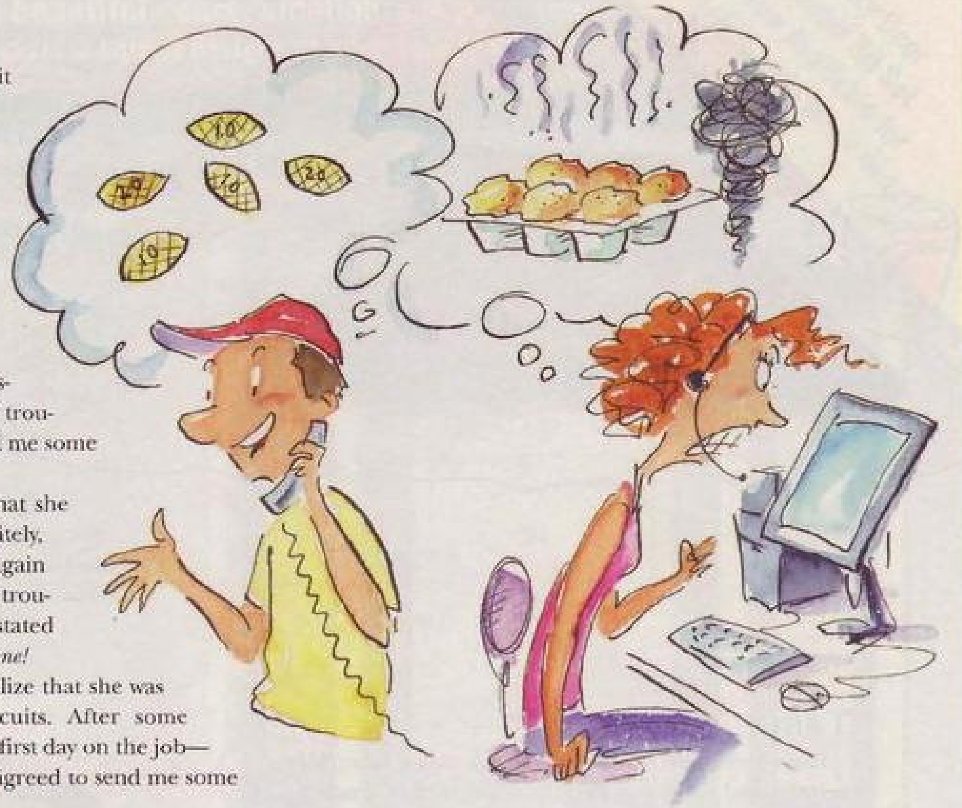
After cleaning my spray equipment, I went into the house to clean up, and that's when I discovered a problem. Thanks to the overspray, my hair was hard as a rock. Not only that, it was standing straight up. My sweatband was securely stuck on as well.

After my wife finished laughing, she applied the only remedy: A close-cropped clip job.

Barry Nelson

ART DIRECTION: VERN JOHNSON • ILLUSTRATION: STEVE BJORKMAN

Biscuit Misfit



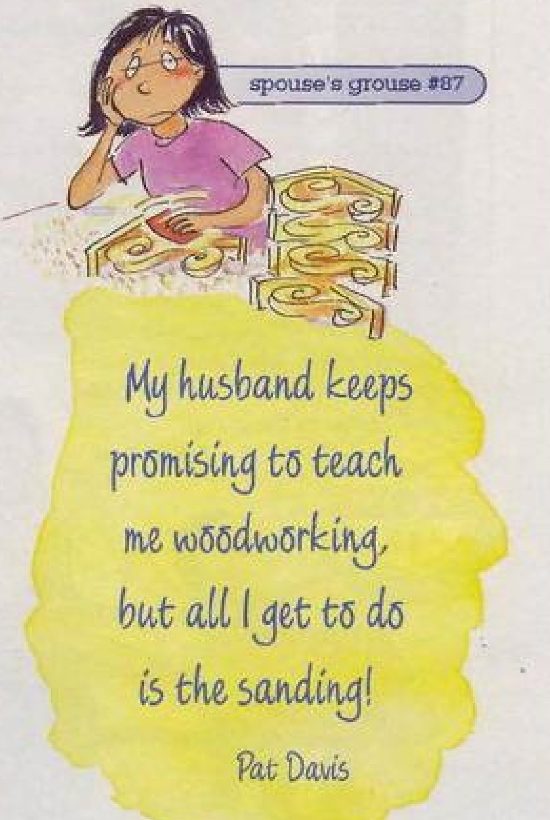
A few years ago, I ordered a biscuit joiner from a reputable mail-order tool seller. The box that arrived was too small for a biscuit joiner—I had been sent a rubber hammer instead.

A nice customer-service woman said there would be no problem exchanging the hammer for the tool I had ordered. Since I had a project waiting that required the biscuit joiner, I suggested that for my trouble and longer wait, she should send me some complimentary biscuits.

After a short pause, she stated that she *would not* send me any biscuits. Politely, I protested this turn of events and again requested some free biscuits for my trouble. After another pause, she firmly stated that she did *not make biscuits for anyone!*

It took me several seconds to realize that she was thinking of another kind of biscuits. After some explaining—it turned out to be her first day on the job—we both had a good laugh and she agreed to send me some *wood* biscuits.

Dave Germain





See-Through Door Panel

I was ready to glue up the raised-panel door for a cabinet I was making for my son. It was a hot summer day and the temperature in my garage shop was over 100 degrees. I knew I had to work fast to keep the glue from drying before the assembly was complete. I applied the glue, assembled the pieces and quickly put them in the clamps. I tightened the screws and checked the assembly to make sure it was square. I was proud of how fast I'd worked and how well the process went, until I noticed the raised panel lying on the bench.

Roland Harris



Mousecapades

We live in the country, so having my husband's shop in our attached garage presents daily challenges. In the winter, mice frequently sneak in to nest in piles of sawdust or stacks of wood. To be helpful, I gave our cat the run of my husband's shop one day, hoping he'd catch some mice.

When my husband came home, he opened the garage door to see our mighty hunter standing proudly over a small corpse. But his initial approval turned into a yell of dismay. Apparently, he'd applied the final coat of polyurethane on a tabletop the night before, and the finish was now mapped with evidence of the great chase. Cat and mouse footprints covered the entire surface. My husband patiently asked that the cat and I *never* help him again.

Gina Stephens

Table Troubles

Last winter I built a rustic table for our dining room. My design called for gluing thirty 2x4s together to create a beefy top. At the lumberyard, I selected the best 2x4s.

Back in my heated shop, I spread glue on the wide faces of all the 2x4s and clamped them together. Then I assembled the trestle-style base.

When my glued-up top was dry, I belt-sanded both sides nice and flat and applied three coats of polyurethane. Proudly, I moved the table to the dining room.

Within a week, however, one corner of the top had begun to lift. After a month, it had twisted 1-1/2 in. above the rest of the table! Numerous cracks had also appeared. My pride and joy was coming apart at the seams.

After hearing my sad story, a woodworking friend explained that construction-grade lumber contains too much moisture to be used for indoor furniture. Appropriately, the table now resides in the garage.

I. Knivsland





Glass-Backwards

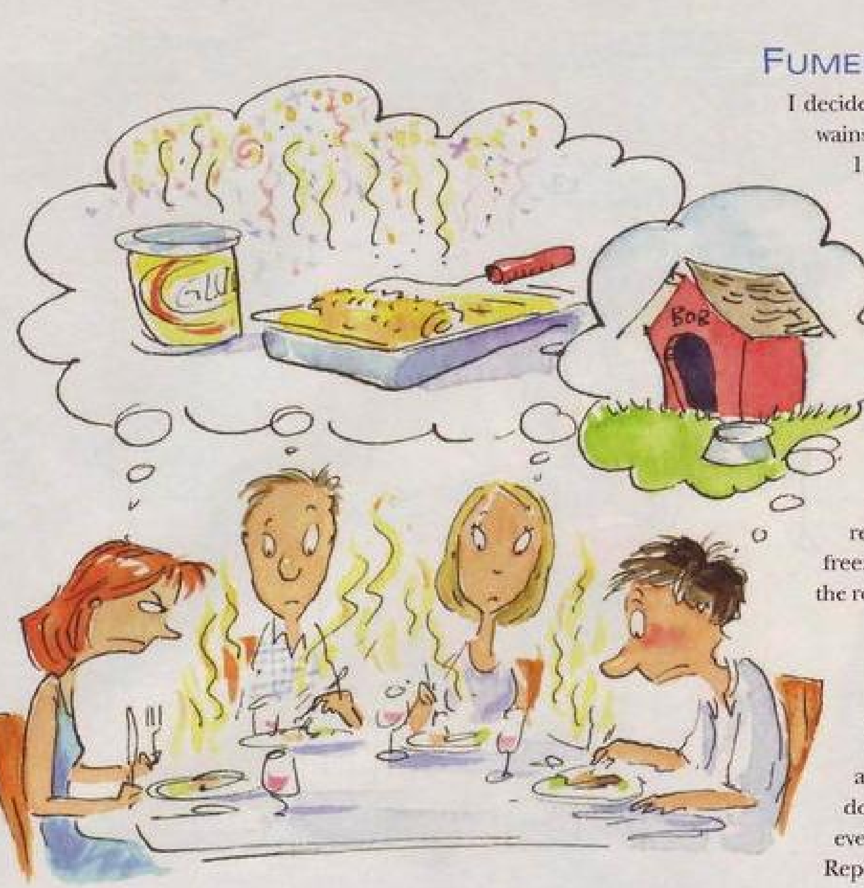
Recently, I agreed to install a beveled-glass panel in a neighbor's hollow-core door. I removed the door and took it to my shop. After cutting the opening, I installed the glass and cut and fit new trim pieces. Then I stained and finished everything.

Triumphantly, I returned to the house to hang the door. But triumph quickly turned to failure when I realized I'd installed the glass in the door's bottom half. Oops!

Needless to say, I had to buy a new door and reinstall the glass. This time I marked the proposed window cutout with a big X, although a dollar sign would have been just as appropriate.

Marlin Bell

Fumed Freezer



I decided to panel my living room with black walnut wainscoting. To create the raised panels, I glued 1/4-in. walnut plywood to 1/2-in.-thick substrate, using contact cement applied with a paint roller.

My living room is quite large, so it took several evenings to complete all the raised panels. I had heard that you could keep paint rollers soft and reusable by wrapping them in plastic and storing them in the freezer. I figured this should work with contact cement just as well. Rather than starting with a new roller each time I glued a batch of panels, I simply retrieved the original roller from our upright freezer. My wife disapproved of this technique, but the roller worked great and I saved about ten bucks.

To celebrate the completed job, we invited friends over for dinner and cooked salmon steaks from the freezer. Unfortunately, they smelled and tasted of contact cement! Our friends were gracious, but my wife was not amused: I knew I was headed straight to the doghouse. Subsequent taste tests confirmed that everything in the freezer had to be tossed. Replacing it all cost more than $400.

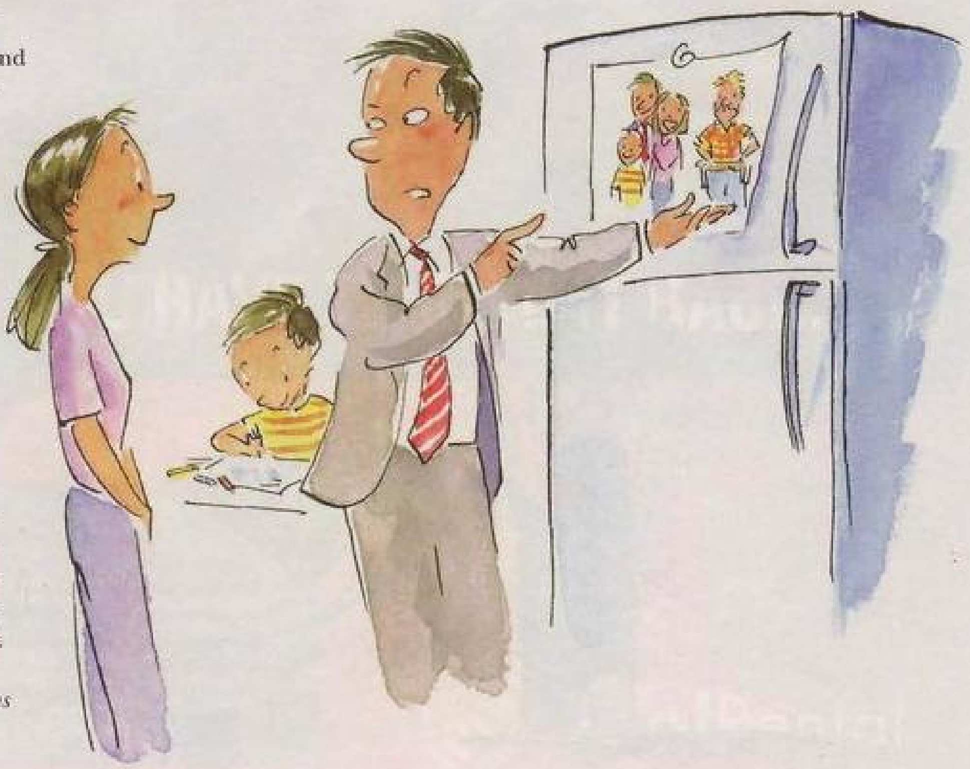
Bob Edenhofer

Family Portrait

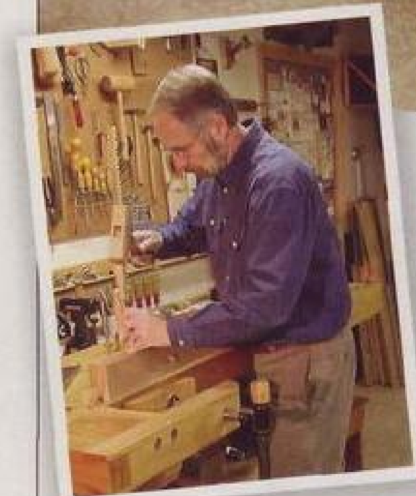
I agreed to manufacture and install authentic wooden moldings throughout a large historic house. Completing the job took more than a year, most of it spent working at the site. During this time, I came to know the family that lived in the house very well.

However, I knew it was time for goodbyes when the mother pointed out her son's most recent masterpiece taped to the refrigerator. His kindergarten assignment had been a family portrait. And there we were: Mom, Dad, little Stevie...and me, wearing my tool belt, work boots and a big smile!

Josh Stephens







Scent-ual Workshop

"Those multicolored drawer fronts are my samples," explains software engineer and avid woodworker Rich Gotz, in describing his shop. "They display different veneers and finishes that *I like* to use." Rich's 20-ft. x 24-ft. shop centers around that 10-ft.-long cabinet. "It provides excellent outfeed support for my saw," he says, "and the top is dead-flat, so it makes a great assembly table. I also use it to set up my benchtop planer, mortiser and mini lathe." Cleverly, Rich's tablesaw is located so that opening a window allows him to rip long boards. The almost reverent arrangement of Rich's hand tools clearly conveys his love of woodworking. "I always spend a moment in my workshop before leaving for work," he admits. "The lingering smell of recently sawn wood definitely has a therapeutic effect!"

Tell us about *your* shop!

Send us photos of your shop and a description of what makes it interesting. What do you make in it, and what makes your shop important to you? Readers whose shops are featured will receive $150.

E-mail your entry to **myshop@rd.com** with digital photos attached. Or mail your description with prints or digital photos on a disc to **My Shop, American Woodworker, 2915 Commers Dr. Suite 700, Eagan, MN 55121.** Please include your phone number. Submissions cannot be returned and become our property on acceptance and payment. We may edit submissions and use them in all print and electronic media.



EDITOR: TIM JOHNSON • ART DIRECTION: VERN JOHNSON • PHOTOGRAPHY: COURTESY OF RICH GOTZ